THE BUILDER

A RECORD OF ARCHITECTURE AND CONSTRUCTION.

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ECONOMY, BUILDING, AND THE WAR.

A DEMOCRATIC government suffers under the disadvantage of being influenced by the temperamental oscillations of outside opinion; and in no way is this weakness more marked than in the disturbance caused to the orderly and economical working of the administrative departments by which and through which it acts.

Administration is separated from politics in centralised governments like that of Germany, where a hostile vote in the Reichstag does not even temporarily affect the settled policy of the Government, as shown in departmental policy, which is carried out with a consistency and method which eliminate waste and secure to the governed the full advantages of any money spent, a result which cannot be so thoroughly effected under a purely democratic system like our own; and, though such consistency has disadvantages which must be manifest from time to time, the counterbalancing advantages tell heavily for efficiency in the national life.

Last autumn the Local Government Board, with a laudable wish to prevent unemployment and relieve the community as far as possible from the effect of a stoppage of building, urged those communities which were considering housing and other utilitarian schemes to expedite them, with the result that the ratio of town-planning and housing schemes which were passed was greater than in any similar previous period; but now, in common with other departments, they appear to be discouraging the very action of the authorities which they originally encouraged. Possibly their original action was premature; but is there not good reason to believe that their present policy is ill-advised and unnecessary?

The whole of the nation is behind the Government in their determination to submit to any sacrifices and put up with any losses rather than impede or jeopardise the successful prosecution of the war, and, if need be, the Government can use any necessary means of compulsion without criticism being raised. If it is in the interests of the community that any trade or occupation should be stopped for the time being, no one, whatever his individual interests were, would raise an objection. But most of us do not know what it is our rulers want. If building is being discouraged on the ground of economy, the reason, as we shall show, seems to be fallacious; but if it is to induce those engaged in the building trades to enlist, make war munitions, or perform other national services, the Government would effect their object more readily by saying so. But because we are waging the greatest war in history, have we any sound reason for thinking that we shall be more successful if we forget other great issues on which the future of the community depends? Germany and Austria, in spite of their military preoccupations, are discussing the terms of a new commercial treaty, which is a sign of the importance they attach to trade interests. We have been successful in raising the greatest War Loan in the history of the world, which shows the national belief in the soundness of our position; but business which rests on the most easily affected of all foundations—confidence and credit—is left to look after itself. We need, if we are to make full use of the opportunities which will be open to us at the conclusion of the war, to organise now, and such organisation will necessitate the spending of money and the erection of factories and plant.

Some of our contemporaries write about building as though it were an unproductive luxury, whereas the great proportion of it is strictly utilitarian in its character, and ministers to necessities, not to the luxury of the "idle rich" or the gratification of pleasure. The buildings which fall under the last heading may well be held over; the remainder should, as far as the state of the labour market permits, be carried out in the usual way.

When a municipality proposes to spend money in building it does so only after its proposals have been subjected to the close criticism of the ratepayers' representatives, and a case for the necessity of its proposals must be made out; and this check will operate at the present time with unusual force. We may therefore assume that the average municipality is wholly unlikely to put forward unreasonable or extravagant schemes, though, even if they do so, the Local Government Board has its power of withholding sanction, and it seems unnecessary that it should pronounce any general dictum on such a matter.

We are told that we should, as far as we can, keep down the value of our imports, as much of the export trade with which we pay for them is cut off by the circumstance of war; but building is not touched by the argument, since, with the exception of a comparatively small number of building materials, money expended in building changes hands within the country, and so long as this is the case the nation cannot be impoverished by the results of building activity. The question now, as always, is whether a building is required or not. If it is, it should be provided; if not, its erection is a luxury or a mistake.

Economy is also promoted by spending at such times as enable us to get the best result for the smallest expenditure; and here again there is good reason for building now rather than after the war, when experts agree that the cost of building is likely to be greater than it is at present. The fact that private individuals are in many cases unable to build what they require at the present time, because they cannot command the usual financial facilities, is another reason for urging that municipal expenditure on building should not be artificially checked by Governmental action, for public authorities are in the more fortunate position of being able to build when the building "market" is favourable to them rather than otherwise.

If the Government require more money for purposes of war they would get it as easily from those who had made profits out of the supply of materials and labour as from those who had paid for these things, for the amount of money available would not be diminished by the simple process of changing hands.

As to the building commodities which are at present largely produced abroad, such as sheet glass, the war should stimulate us to put down plant and erect works in order that in the future we shall be able to supply our own wants; while in the case of timber the war should give an additional impetus to the employment of the cheaper forms of fireproof construction, by means of which we are able to dispense with the necessity of using goods which are produced abroad.

Last but not least it will be found that the amounts spent by local bodies on building in normal times bear a small proportion only to what is spent in other services, and it is in the direction of the last factor and not the first that economy might be most readily effected.

We are not by any means sure that there is not sound sense in the proposal mooted in certain quarters that a loan should be raised for financing reliable enterprises which have for their object the securing of new markets which will be open to us at the conclusion of the war. We refer especially to such commodities as glass, but many others might be mentioned, for we may rest assured that, without enterprise and determination, other nations having more faith but not greater resources will secure, in the industrial war which will follow the conclusion of peace, advantages which might have been our own.

Business results not from the accumulation of capital in certain hands, but in its wise use in promoting the circulation of money to the advantage of a community and country regarded as a single unit, and in the encouragement of a spirit of reasonable confidence. The money locked up in the war chest of Spandau is money which is available only for the prosecution

of war; but German prosperity has been the result of the promotion of trade interests by spending wisely rather than in the hoarding of gold.

Our case would be invalidated could it be shown that the whole of those employed in the building trades ought to be making war munitions or serving in the Army; but we do not believe this is so, and, if not in the interests of the community and for the successful prosecution of the war, the Government should encourage the municipalities to support the building industry.

When what is required in money, men, or munitions for the purposes of war has been provided the next requirement is that the remainder of the population should be employed in doing work which will have to be, in the interests of the community, carried out in the near future, and the Government whose policy can bring this about will be acting in the interests of economy, which is not promoted by the alternations of booms and periods of unemployment. Borrowing may be absolutely justified if it enables us to secure the opportunity of spending less to secure the same result.

We are told by historians that the general conditions of life in this country were almost unaltered when we were waging a twenty years' war against Napoleon and at the same time financing his European foes, although the population of the country at the time only amounted to some fifteen millions; and with the inexhaustible resources of the British Empire behind us, and the extraordinary loyalty of all the communities of Greater Britain and India, we should be able both to play our part in the war and prepare for those other trials and opportunities which will lie before us when peace comes.

Should the authorities decide differently, they should at least encourage public bodies to have preliminary work, such as the preparation of drawings and estimates for projected and approved work, done now, so that when peace comes the workers shall not be kept waiting in unemployment during the necessary preliminary consideration and preparation of building schemes. This, though a minor programme, is one based on common sense, and should commend itself to the consideration of all who are placed in authority.

NOTES.

The A.A. Schools. ALTHOUGH the Architectural Association Schools have suffered in numbers in consequence of the large proportion of members who are serving in the Army, the quality of the students' work is unusually high and very creditable to all concerned. The annual prize-giving meeting took place last Thursday week, and the President, Mr. Austen Hall, made a brief speech in which he emphasised the great advantages possessed by the students of to-day, who were able to learn at the Association Schools the right way to work and the right ideals to pursue instead of searching for them for years, as he and others had to do in the past. Mrs. Hall then distributed the prizes, and Mr. Ernest Newton proposed a vote of thanks to her in a brief speech in which he pointed out that the consensus of agreement as to style was at present a very vague one, a feeling that some kind of Renaissance was suitable for most public buildings; that either Gothic or a type of Classic might be used for a church; while with regard to a house we could go much as we pleased; but he added that the Association teaching would make students see the necessity of considering the purpose of buildings in design, and learning to avoid shams and false construction. Mr. Arthur Keen seconded the vote of thanks, bearing testimony to the results of Mr. Atkinson's work in the Schools, the vote of thanks being carried with acclamation. We shall, in our next issue, comment on the designs sent in and illustrate some of them, and we hope next year circumstances will permit of an exhibition representing the whole strength of the Association Schools. The Council may well congratulate themselves on the results of their choice, for in Mr. Atkinson they have discovered one of the exceptional men who are capable of communicating their own knowledge and enthusiasm to others, a gift requiring unusual personal magnetism and insight. There are very many architects in actual practice to-day who would have done better work and met with greater success could they have had the advantages which are now open to students of the Association Schools.

Architects and Cottages. WE have received copies of an interesting correspondence which has passed between the Secretary of the Society of Architects and the Board of Agriculture and Fisheries, which demonstrates the active interest taken by the Society in professional matters, but in which exception is taken to the fact that the Board in issuing plans and specifications do not make any specific reference to the advisability of retaining an architect's services in carrying them out. Mr. Christopher Turner, who was Chairman of the Advisory Committee, reports to the President of the Board of Agriculture and Fisheries that the sample specification in the Report requires "the whole of the work to be carried out to the satisfaction of the architect or employer's agent," and quotes passages in the Report emphasising the need for careful planning of cottages and "the importance of a careful lay-out plan with a view to prevent the spoiling of our villages and hamlets by the building of incongruous houses in unsuitable positions." Mr. Turner further goes on to say that, in view of the fact that many surveyors and estate agents have made a special study of the planning of cottages, the Committee do not feel it to be within their functions to say that none but architects are qualified to design them, nor do they think that anything in the Report will, as alleged, give the impression that professional advice is unnecessary in such matters. We think the views expressed on behalf of the Society of Architects are exaggerated, and that Mr. Christopher Turner's letter proves that the Advisory Committee are far from depreciating the value of an architect's services or suggesting in any way that those who wish to build cottages are wise in their own interests in dispensing with professional advice. It is also unfortunately true, as Mr. Turner points out, that by far the larger number of cottages are built without the aid of professional advice of any kind.

The Duty of an Advisory Committee. THE correspondence suggests some interesting reflections on the duties of an architect on such a Committee. Should he hold a brief for his profession, or should he mainly try to accomplish the work for which the Committee is appointed? We think the last-mentioned object is that which he should endeavour to perform. The object of the Advisory Committee is to make such suggestions and give plans to render them explanatory, with the object of indicating to those thinking of building the best types to adopt. If such a document is converted into a brief for the employment of architects, it would be discounted by many and would by most people be considered to be *ultra vires*. An architect placed on a Committee on Rural Housing should be more careful than any other member to emphasise the value of competent advice and direction, leaving it for others to determine the profession which can best give such advice. If a Committee were appointed to define the character of accommodation which should be provided in a railway-station, it should confine itself to that function only, as it is not appointed to draw up a brief for an architect or for an engineer. We have heard many criticise the action of the Board of Agriculture and Fisheries because they have published cottage designs and specifications, but general advice without example is of little use, and the objects of the Committee's labours is to convey information to those requiring it on the subject of housing for the welfare of the community. We do not for a moment believe that the publication of model plans would detrimentally affect architects; if we did believe it we can quite understand that it might, nevertheless, be in the public interest that such plans should be given; but we fully believe that the result of attracting interest to the subject will be the greater employment of those best qualified to deal with it. As a matter of fact there are many little books containing plans of cottages and small houses as well as general directions for their construction, but we have never come across anyone who has endeavoured to use them directly. More often they read the architect's name and, if they like his work, consult him with regard to any building they contemplate erecting.

Philip Webb and his Epoch. APPRECIATIONS of the life and work of the late Philip Webb suggest that his death may be taken as closing a definite phase in the history of architectural development in England. As one of the first, if not the very first, of moderns to appreciate the value of the crafts and to insist on the logical and artistic treatment of materials, Philip Webb will always fill an honoured niche in the temple of architectural fame, but the movement which he helped to originate is still alive, and we see no reason to think that his death will lead to the neglect of qualities which we hope will always be characteristic of English architecture. There is, however, a sense in which this remark may express an aspect of the truth. Architectural ideals progress, and while the present generation still attaches value to Philip Webb's point of view it has a view of its own. It values craftsmanship and all that this means in the way of appropriate design, but this is no longer its chief preoccupation. It realises that architecture is something more; that it possesses possibilities for the expression of ideas which, if not undreamt of, were apparently ignored by the school of which Philip Webb was so brilliant an ornament. It is now concentrating on these wider possibilities, and in this sense it may be said that a chapter has been closed, but the chapter that we are teaching now is a continuation of the same theme. We are not ignoring the writing of Philip Webb, but trying to relate it to newer ideas and to fit it in to what we feel to be a wider and truer conception of the nature and possibilities of architecture.

EXHIBITION OF STUDENTS' WORK AT THE LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

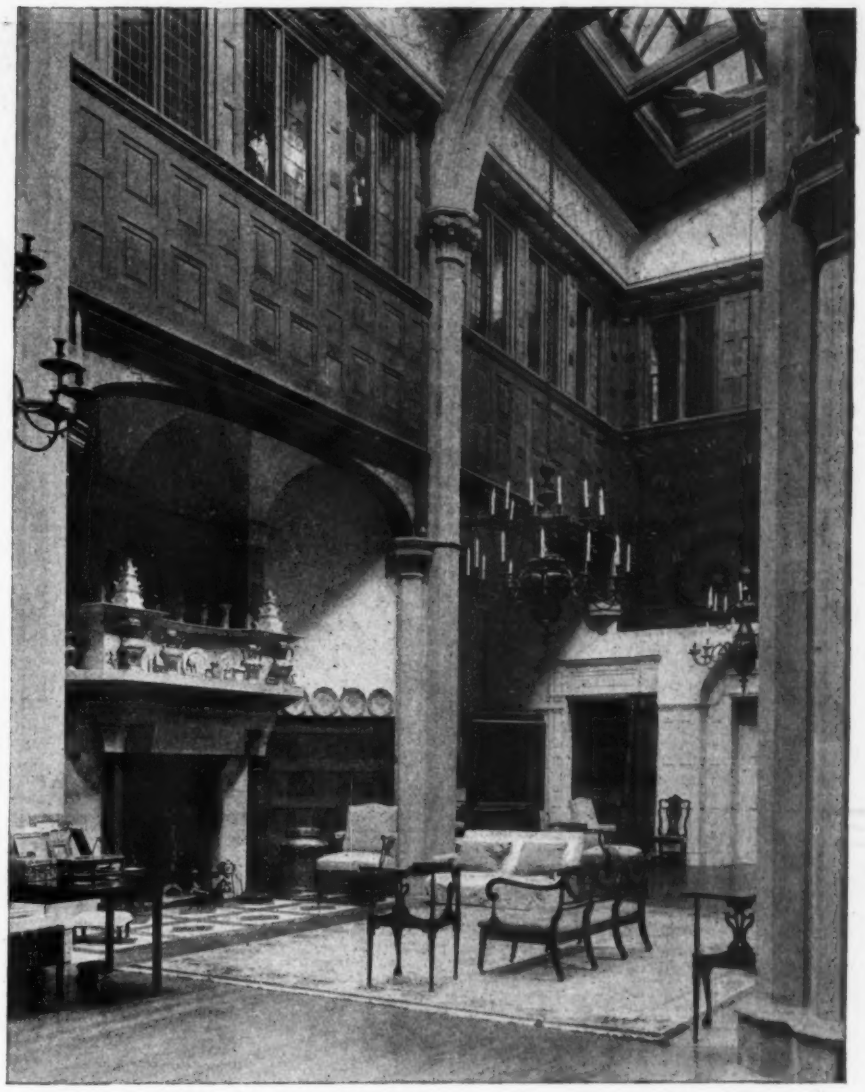
THE annual exhibition of the Liverpool School of Architecture this year was naturally smaller than in previous years, more than half the studio having volunteered for military service. At the same time, the work of the half-dozen best students was well up to the average expected of the Liverpool School. To those who have followed its growth and development there were two features of particular interest in this year's show. For the first time there were students taking two of the more recently established qualifying examinations, both interesting departures in architectural education—the B. Arch. and the Certificate in Architectural Design.

The degree course, it will be remembered, requires for its final stage two years of practical work in an office, while academic education is completed by a thesis to be submitted at the close of the period. Mr. Lawrence and Mr. Dixon, the two students who took their degree, submitted theses of the different types allowed—the former an elaborately-worked-up original design, and the latter an essay illustrated by drawings, sketches, and photographs. Mr. Dixon's subject was a study of the architects of the Neo-Grec period in France, and he produced a thesis containing an immense amount of valuable material, much of it obtained from original sources inaccessible to the ordinary reader. We hope to see this published as a separate treatise.

The Certificate in Architectural Design was instituted to meet the needs of those young architects who, having probably passed the Intermediate R.I.B.A., and having spent some years in an office, do not wish to take the full Certificate in Architecture, with its regular lectures on the History of Architecture, Building Construction, Graphic Statics, etc., but who are desirous of spending some time in the Liverpool School studying the special phase of architectural design for which it is particularly noted. Mr. Vincent Hull and Mr. Gordon Hemm would both appear to be students of this advanced type, and the studies which both of them submitted for a law court (presumably with a view to the Prix de Rome) were fine performances in design and draughtsmanship.

Of the diploma work, "Certificate for Architecture," that submitted by Mr. Topling and Mr. Sanders appeared the most distinguished; we were taken with the former's design for an art-dealer's shop front, a refined and spirited piece of work.

The most interesting designs in the exhibition were those submitted by students for both certificates for the "Lever Prize," the subject for which this year was the redesigning of the front of the Lime-street Hotel and Station opposite St. George's Hall, Liverpool. The present erection, it is needless to say, exhibits some of the worst features of the expiring efforts of the Gothic Revival School, when its exponents, feeling the ground slipping away from under their feet, felt impelled to shout their doctrines with the greater shrillness, and took every opportunity to thrust their spikiest erections in close juxtaposition with the assured triumphs of Classic art. It was an inspiring subject to a student to attempt to replace the Lime-street Hotel by something more congruous with St. George's Hall; the practical difficulties of the problem were also considerable owing to the change of level across the front and the double access necessary for the station. Mr. Vincent Hull, who was awarded first prize, submitted a design which fully recognised that the front must be subservient to St. George's Hall, and he appeared to have overcome the difficulty of the levels better than any other competitor. Mr. Topling, second prizeman, attempted, possibly, to introduce too much incidental interest into his façade; but otherwise it was a praiseworthy effort. We should have liked to have seen a design in which the hotel was not the prominent element, and in which the station entrance on the great City Portal giving on to the "Place" predominated. But this conception was apparently not suggested by the programme for the prize.



The Hall, "Clouds."

Work of the late Philip Webb.

(From "English House Design," by Ernest Willmott, F.R.I.B.A.)

THE DINING-ROOM AND HALL, "CLOUDS."

THESE illustrations, which are reproduced from Willmott's "English House Design," and which we are able to reproduce through the courtesy of Messrs. Batsford, Ltd., are excellent examples of the refinement and sense of proportion shown in Philip Webb's work. Webb and Shaw were the pioneers of the advance in quality which has taken place in English domestic design, and left it without a rival, and, although Webb was less known than Shaw, his contribution to the result was a very great one.

MERTON, SURREY.

The eighth centenary of the parish church has just been celebrated. In pulling down the wall of a house in premises belonging to Messrs Liberty has been found an almost entire Norman arch—a vestige of the priory buildings—which, we understand, will be carefully preserved. In 1115 Henry I. bestowed the manor upon Gilbert the Norman, Sheriff of the county, who built, close to the now parish church, a monastery (of wood) for Austin canons. Fifteen years afterwards were laid the foundations of the stone church; the cloister and other buildings were completed in 1136. Henry VIII. pulled down the priory church and the buildings in order to use the stones for his palace of Nonsuch, near Ewell. The parish church, which has a transitional north doorway, was restored and enlarged fifty years ago.

ARCHITECTURAL SOCIETIES.

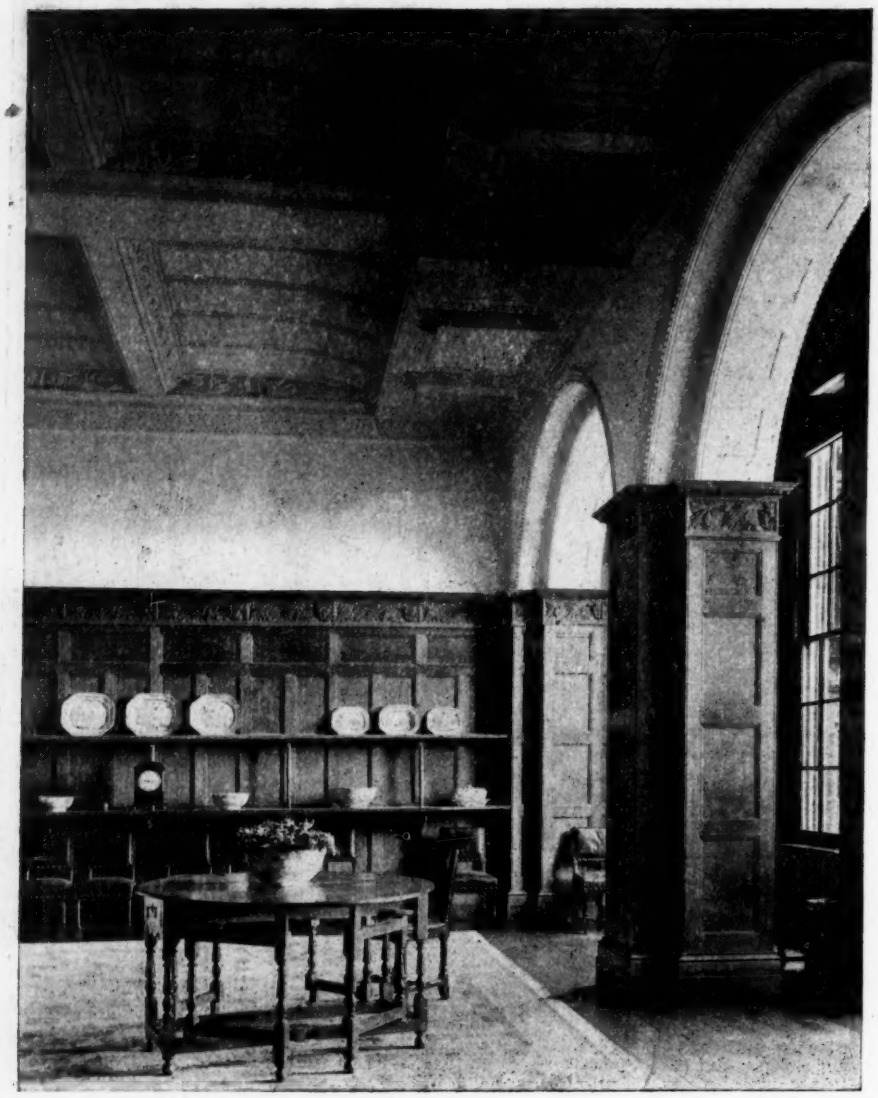
Nottingham and Derby Architectural Society.

On Friday, July 16, about twenty members of this Society accepted the invitation of Mr. W. V. Betts, Architect to the Nottingham Co-operative Society, to inspect the steel construction and fireproof flooring at their premises now being erected in Parliament-street, Nottingham. Mr. Betts explained the plans and drawings and then conducted the party over the building.

A café has been provided in the basement, shops on the ground floor, with department stores on the upper floors, all connected with suitably-placed staircases and lifts. In order to reduce the fire insurance premiums, the floors are mainly in reinforced concrete, Fawcett's mon'lithcrete system being adopted, and fire sprinklers will be provided throughout. Although the floors are divided practically into three main divisions by curtain walls, these have been so arranged that at any future time they may be altered in position to suit requirements without interfering with the construction of the floors. The whole weight of the floors and superimposed loads are carried by the system of girders on to main piers and steel stanchions, which extend the full height of the building.

At the conclusion of the visit the President of the Society, Mr. Harry Gill, complimented Mr. Betts on his carefully-thought-out building, and thanked him for so fully describing the points of construction and also for his kindness and hospitality.

Mr. G. H. Widdows, Derby, endorsed the vote of thanks, and in his reply Mr. Betts mentioned that the Nottingham Co-operative Society had acted most patriotically in deciding to proceed with the building notwithstanding the war, in order to keep the building trade in employment. He invited the Society to visit the premises on completion and then pass their opinion upon them.



The Dining-Room, "Clouds."

Work of the late Philip Webb. (*See page* 63.)

(From "English House Design," by Ernest Willmott, F.R.I.B.A.)

COMPETITION NEWS.

It must be understood that the following paragraphs are printed as news, and not as advertisements; and that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that may occur.

The list of current competitions is printed on page 76.

County Council Offices, Louth.

The designs of Messrs. O'Callaghan & Webb, architects, South Frederick-street, Dublin, have been accepted for the new offices to be erected in Dundalk for the Louth County Council. The assessor, Professor Scott, of Dublin, had a large number of designs to choose from, and in addition to the above award he placed the designs of Messrs. Batchelor & Hicks, Merrion-square, Dublin, and Mr. Thomas J. Cullen, Suffolk-street, Dublin, second and third, respectively.

Cottage Competition, Bromborough Port Estate.

Two of the competitors in this competition sent their drawings to Messrs. Lever Brothers without enclosing envelopes. In consequence it has been impossible to discover to whom the drawings belong, and therefore Messrs. Lever are unable to return them. Any competitor who has not received his drawings back should communicate with Messrs. Lever Brothers, Ltd.

OBITUARY.

Mr. James Tait.

The death occurred recently, at his residence at Painswick, near Stroud, Gloucestershire, of Mr. James Tait, aged eighty, the oldest member of the Leicester and Leicestershire Society of Architects. Mr. Tait, who gave up practice in Leicester about fifteen years ago, when he first came to the town was associated in partnership with Mr. Bidlake. Later he worked in collaboration with Mr. John Langham, and when he finally gave up practice he had worked in professional companionship with Mr. Albert Herbert, a former pupil, who now carries on the practice. For many years Mr. Tait carried on his profession in Friar-lane, and at one time lived over his offices. He had a practice which extended to many parts of England.

Lieut. J. L. Chester.

Lieut. James Leslie Chester, 9th Liverpool Regiment, T.F., was killed in France on July 6. He was the only son of Mr. J. T. Chester, first Mayor of Wallasey. On quitting Birkenhead School, where he was captain of the cricket and football teams two years ago, he entered the offices, as a pupil, of Mr. T. Taliesin Rees, F.R.I.B.A., of Liverpool. He enlisted in the 9th Liverpool Regiment in last August, and received his commission in November.

GENERAL NEWS.

A.A. Red Cross Voluntary Aid Detachment.

First Aid lectures and instruction in connection with this detachment will be given by Dr. Arthur Spicer on the following Wednesdays at 8.30 p.m. :—July 21, 28 ; August 4, 11, 18, 25. Ambulance drills and practices will be held every Thursday at 6 p.m. until further notice. Those wishing to qualify for membership of the Detachment must pass the Red Cross Examination, which will be held at the end of the lecture course, and only those who attend at least five lectures will be eligible to sit for the examination. All lectures and drills will take place at the A.A., No. 18, Tufton-street, Westminster, S.W. Recruits, we are informed, are urgently needed to make up the full membership required.

The National Physical Laboratory.

In their Report for the year 1914-15 the Executive Committee of the National Physical Laboratory state that Sir John Cowan, of Messrs. Redpath, Brown, & Co., has entrusted the Laboratory with the design and erection of a machine for testing large slabs of reinforced concrete, beams and other members employed in concrete construction, while preliminary work in connection with an important research for the Associated Portland Cement Manufacturers is in progress. The Laboratory has given assistance in various ways to the Home Office, the India Office, the Post Office, the

Haggerston Castle.

Mr. J. B. Dunn, F.R.I.B.A., Architect.

Office of Works and the Crown Agents. An investigation for the Office of Works into cracks which have shown themselves in the masonry of the Tower of London, the Committee says, promises to be of interest.

Skilled Men for Active Service.

The Royal Engineers of the 1st London Divisional Territorial Force are recruiting for new Field Companies to back up those now fighting in France and the Dardanelles. They ask for skilled, intelligent, vigorous men, and particularly those who have been used to responsibility, as it often happens that individual sappers of the Royal Engineers have to take charge of working parties of other arms. Carpenters, bricklayers, masons, and men connected with the building trades, not employed on Government work or in the production of munitions of war, are required; also a few coopers and experienced draughtsmen and surveyors. The work is interesting and varied, including bridging, pontooning, earthworks, and explosives. Each company has its own transport vehicles and horses, and some men experienced in care of horses are wanted as drivers. Applications should be made to the Recruiting Officer, 10, Victoria Park-square, London, N.E.

Wimbledon Park.

Terms are arranged for the purchase from Lady Lane by the Wimbledon Town Council of the estate, of about 150 acres, with the lake, for preservation as an open space. The Lords of the Treasury agree to the lending by the Ecclesiastical Commissioners of £30,000 to the Town Council conditionally upon the balance (£40,000) of the purchase-money not being borrowed before the conclusion of the war.

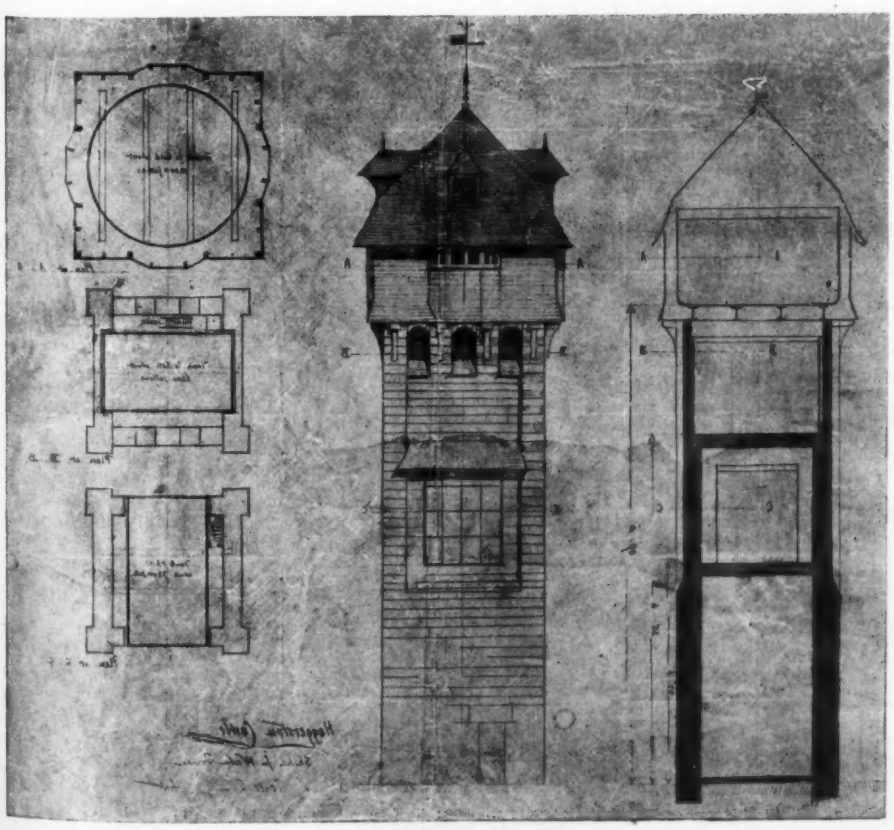
Oxford University.

In the course of next October will be opened the new chemical laboratory, which has been built upon a site adjoining the University Museum, after plans and designs by Mr. Paul Waterhouse. For the equipment and endowment of the laboratory Mr. C. W. Dyson Perrins, of Davenham, Malvern, and formerly of Queen's College, Oxford, will supplement his former gift of £5,000 with a sum of £25,000 in furtherance of the study of organic chemistry. The Waynflete Chair is now held by Professor W. H. Perkin, F.R.S., for whom Mr. Paul Waterhouse designed the "John Morley" Laboratory (as well as the Botanical Laboratory), Manchester University, seven years ago. Through the death on July 15 of Mr. Robert William Raper, M.A., B.C.L., Vice-President and Bursar of Trinity College, Oxford, the cause of the preservation of open spaces loses a warm supporter. He rescued from enclosure and secured for the University the summit of Shotover; he was mainly instrumental in the conservation of the public and of the commoners' rights in the Malvern Hills, and was a representative of the University upon the Council of the National Trust; he was also curator of the Botanical Gardens and University Parks, and a conservator under the Malvern Hills Act of 1884.

[*Photo: Donald Scott, Edinburgh.*

Haggerston Castle: Principal Staircase.

Mr. J. B. Dunn, F.R.I.B.A., Architect.

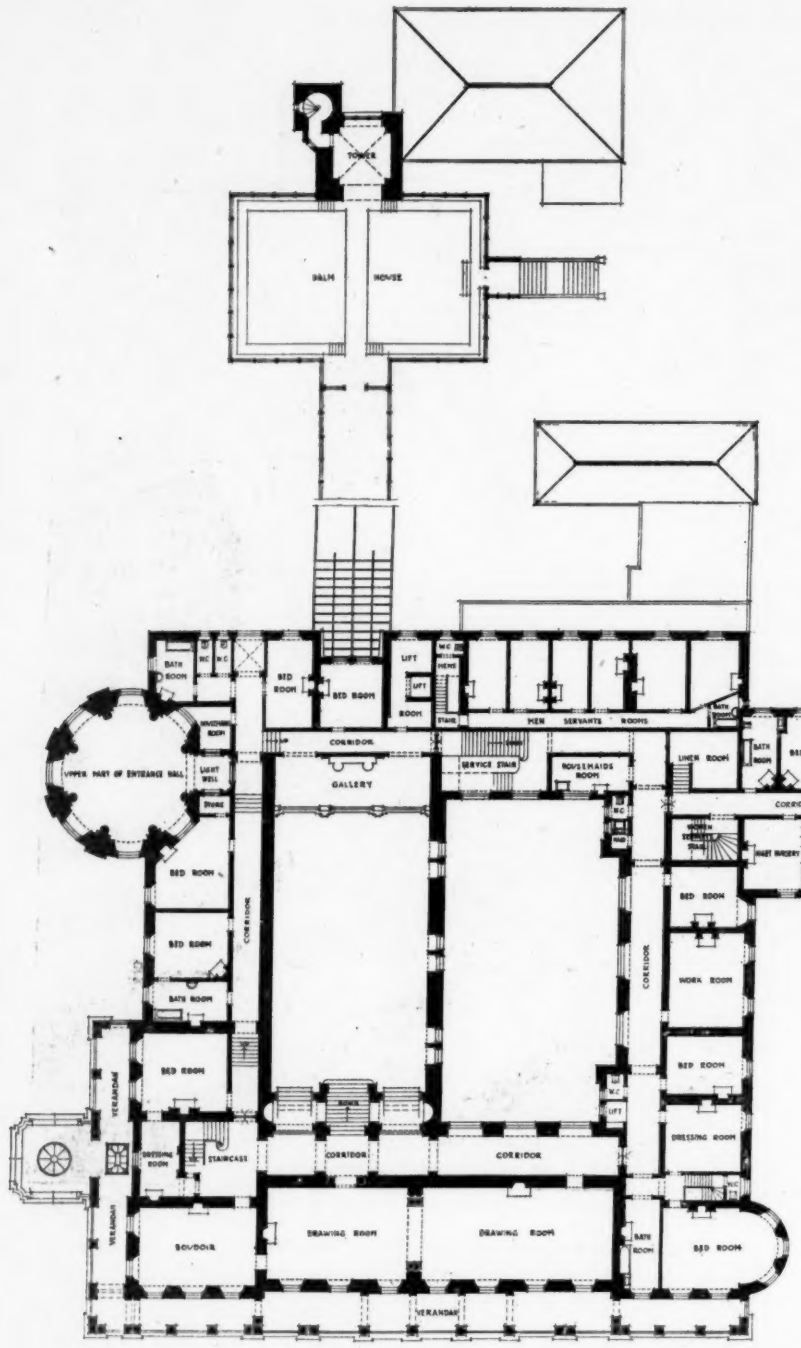


Haggerston Castle: Design for Water-Tower.

By the late R. Norman Shaw, R.A. Not carried out.

Church Building Society.

The Incorporated Church Building Society held its usual monthly meeting on the 15th inst. at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., Lieut.-Colonel the Hon. G. H. W. Windsor-Clive in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Acton Green, St. Peter, Middlesex, £175; and Maesycwmmer, St. Thomas, Mons., £100; and towards enlarging or otherwise improving the accommodation in the churches at Bermondsey, St. Augustine, Surrey, £50; St. Pancras, St. Bartholomew, Middlesex, £60; Shoreditch, St. Michael, Middlesex, £25; Southgate, St. Andrew, Middlesex, £100; and Whitstable, St. Peter, Kent, £125. The following grants were also paid for works completed:—Siddal, St. Mark, Halifax, £175; Bridge Sollers, St. Andrew, Hereford, £5; Limehouse, St. Peter, Middlesex, £20; Ilford, St. Luke, Essex, £200; Barking, St. Paul, Essex, £75; Potters Bar, St. Mary-the-Virgin and All Saints, Middlesex, £125; Barry, All Saints, Glams, £80 balance of grant of £200; Gloucester, St. Catherine, £150; and Easton, St. Gabriel, Bristol, £30. In addition to this the sum of £140 was paid towards the repairs of thirteen churches from Trust Funds held by the Society.



PLAN OF FIRST FLOOR

BOOKS.

Home Interiors. By R. GOULBURN LOVELL, A.R.I.B.A., M.S.A. In five sections, at 15s. each, net. (London: The Caxton Publishing Company, Ltd.)

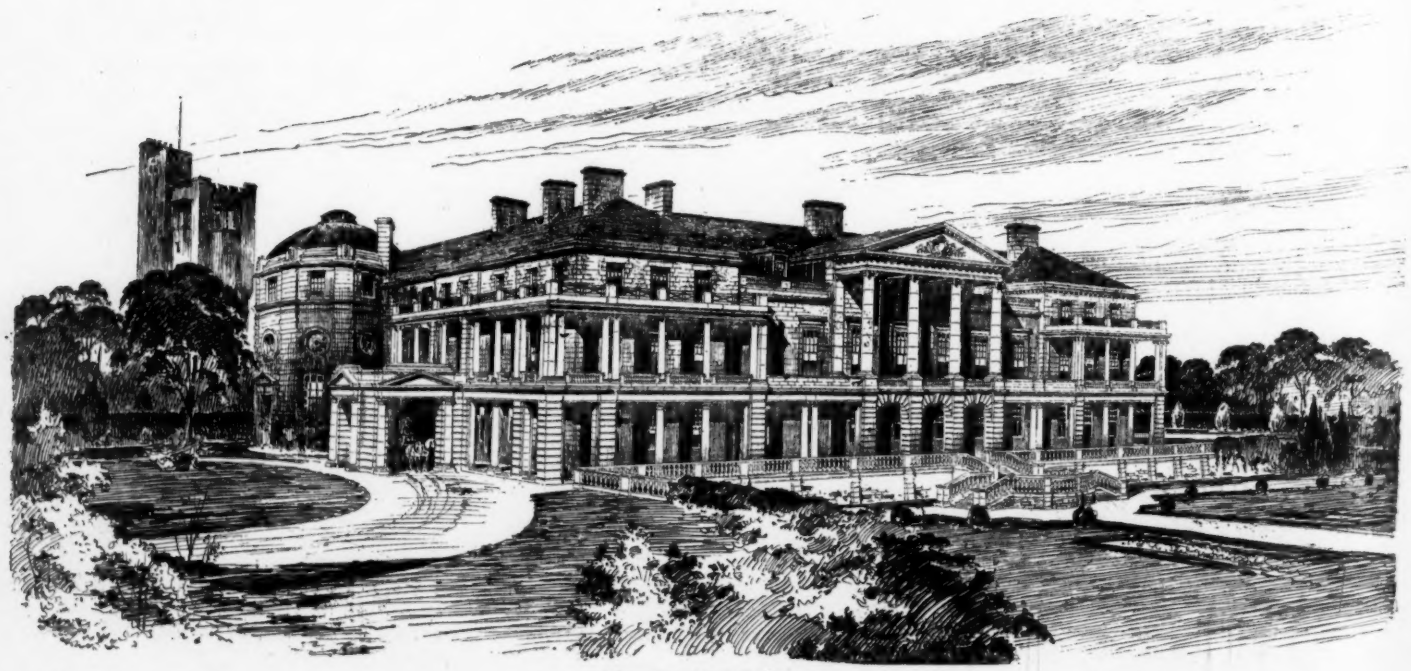
WE have already in a previous review dealt with the general scope and intention of this interesting book by Mr. R. Goulburn Lovell, entitled "Home Interiors," of which Section 5 is now before us. As we then pointed out, Mr. Lovell's object is to afford authoritative guidance to decorators and others dealing with colour and colour schemes, and he provides a definite method of securing correct colour combinations by means of coloured charts and revolving discs, the use of which will ensure harmonious results.

Section 5 consists of detail drawings and colour plates of three different schemes—a blue and grey drawing-room, a green drawing-room, and a blue and gold sitting-room, all of which are pleasing in effect and serve to illustrate Mr. Lovell's method. Each scheme has a sheet of working instructions attached, and is illustrated by two colour plates and numerous half full-size details. We have already remarked on the novelty and ingenuity of a book which we feel sure will be found useful to the amateur as well as to the professional decorator.

Timber. By W. BULLOCK. (Sir Isaac Pitman & Sons, Ltd. 1s. 6d. net.)

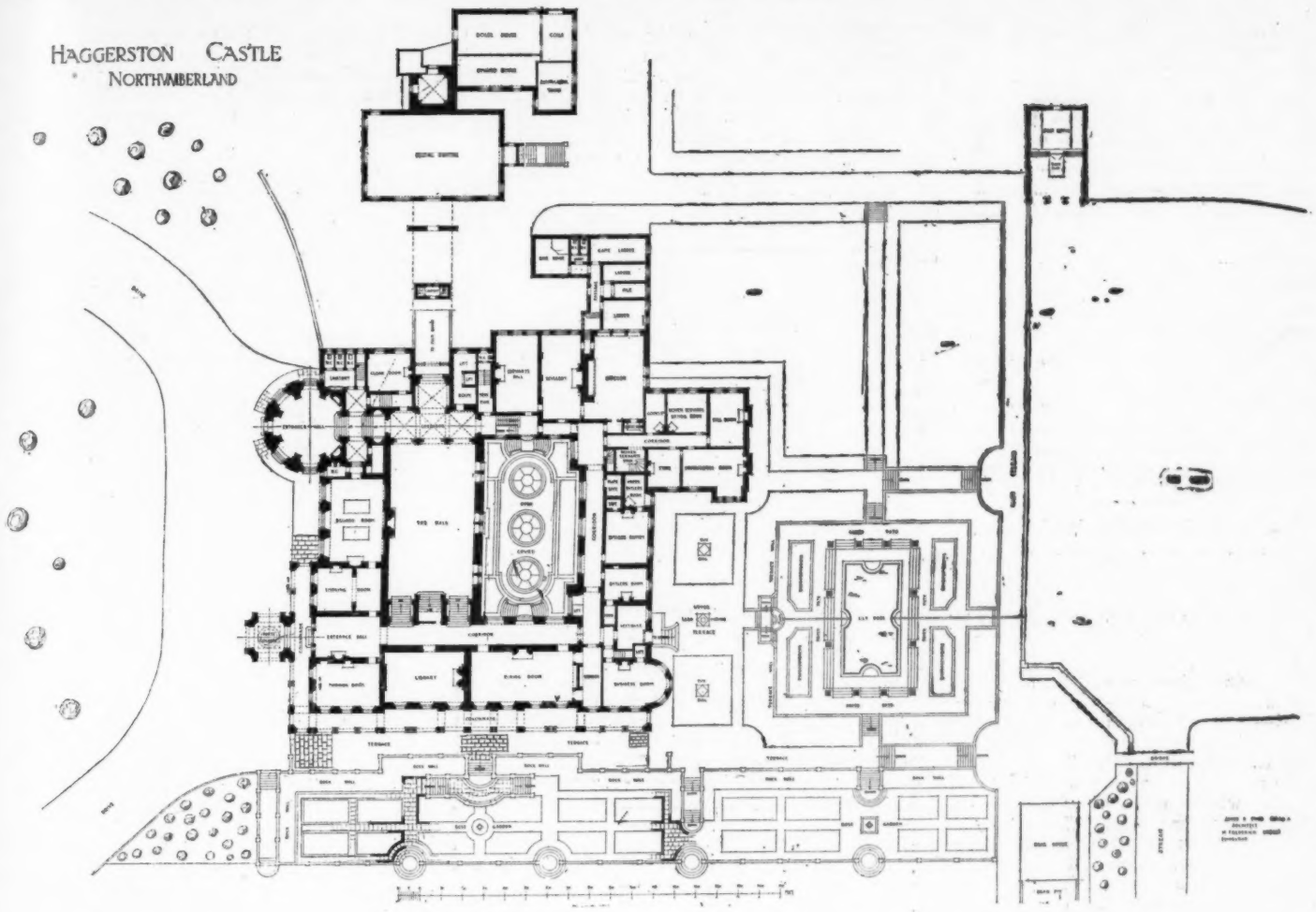
THIS addition to the popular series of Common Commodities of Commerce is intended for those who wish to know the facts about supply and demand in the timber market and any other essential facts which have any bearing upon market conditions except prices, which do not come within its scope. It is thoroughly practical and reliable so far as any general work of this kind can be, and gives a very fair estimate of the world's supply available. Lately, owing to the special conditions, new fields have been discovered, such as Macedonia for hardwoods (see *Timber Trades Journal*, June 5), Lagos for walnut, and others. We have imported timber since the sixteenth century, and are now the largest importers in the world, the value of our imports exceeding £30,000,000; while we grow ourselves timber only worth a paltry £500,000. The author deplores this improvidence, which is universal, and predicts that even the United States will be unable to continue exporting for another twenty years. Afforestation is now part of our national programme, and part of our 15,000,000 acres of waste and uncultivated lands suitable for such a purpose will, as soon as circumstances permit, be planted. Encouraging figures are given relating to experiments in State forestry in Saxony on a large scale. There we find a yield of 21s. per acre, while the capital is maintained intact.

English oak is coming once more into favour, and the rare and beautiful variety



Haggerston Castle.

Mr. J. B. Dunn, F.R.I.B.A., Architect.

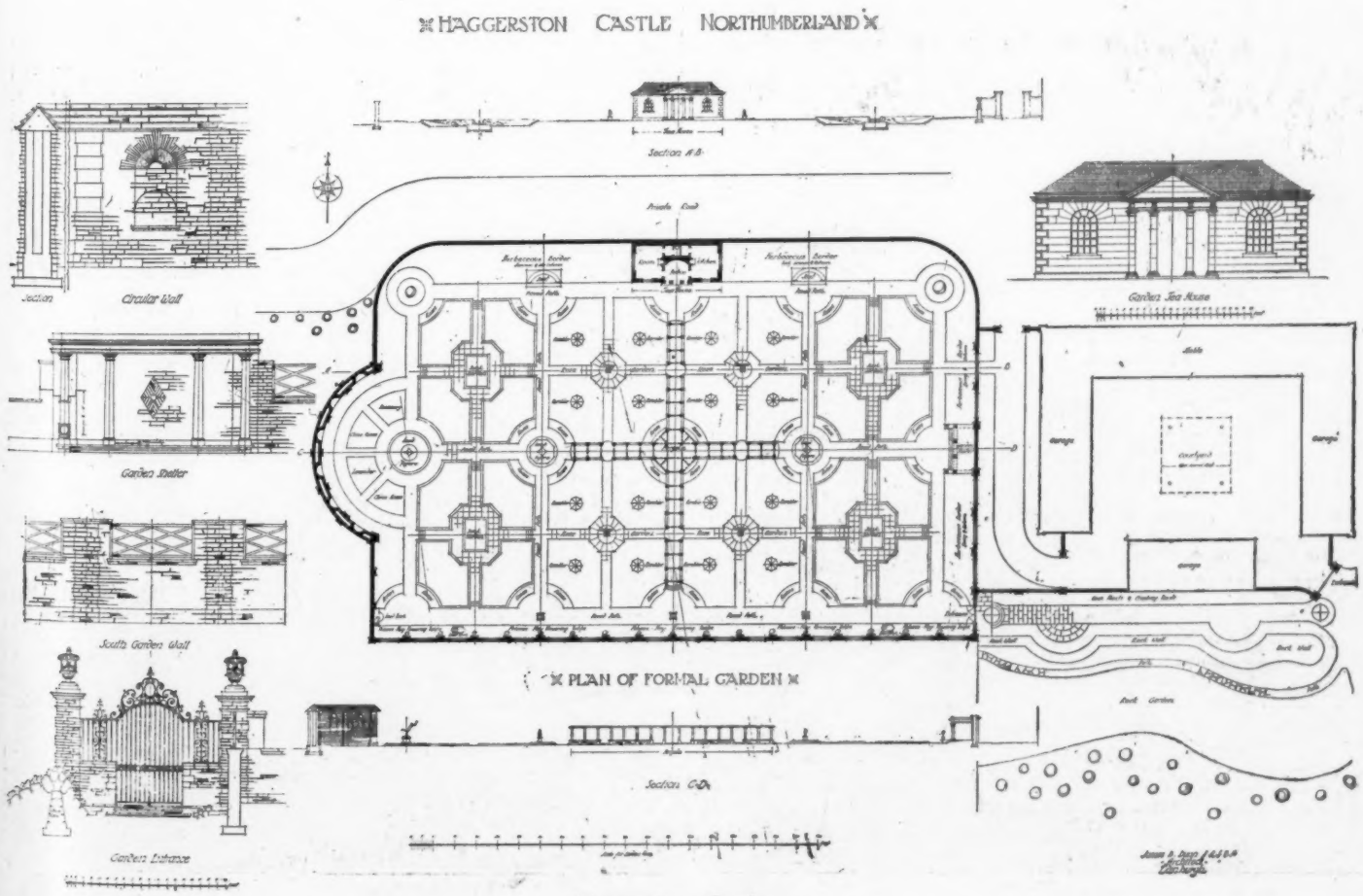


known as brown oak, which seems to be indigenous to this country, will realise high prices. It is generally sawn into veneers and used for furniture. The trees which yield it are found in the Southern and more often in the Midland Counties. The brown colour was until lately attributed to incipient decay, but it is also found in young straight-grown maiden trees. There is an interesting chapter on the various methods of getting timber to its destination after felling.

Geometry of Building Construction (*Second-Year Course*). By F. E. DRURY, F.I.S.E. (London: George Routledge & Sons, Ltd., Broadway House, 68-78, Carter-lane, E.C. Price 3s. net.)

THIS volume is intended for students who have already passed through the first year book of the subject published some time ago, under the series of the Broadway Text-Books, and several references are made to the first volume. An introduction is written by Mr. C. H. Reilly, M.A., in which he states the main objects of the series and the principles aimed at, and there is no doubt that the text-books are a step in the right direction if the standard attained by the present book is maintained throughout other works.

It is impossible to successfully study advanced construction and design without a thorough knowledge of geometry and practical mathematics, and these two subjects are often seriously neglected by the student.



Haggerston Castle.
Mr. J. B. Dunn, F.R.I.B.A., Architect.

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ILLUSTRATIONS.

Haggerston Castle, Northumberland.

HAGGERSTON CASTLE dates back as far as 1388. It was originally the seat of the Haggerstone family, but in 1618 the old castle was destroyed by fire, only the principal tower remaining.

The estate and castle passed into the hands of the Leyland family in 1858, and in 1894 the present proprietor—Mr. Christopher J. Leyland—rebuilt the mansion-house, extensive additions being made under the direction of the late R. Norman Shaw, R.A.

Three and a half years ago a disastrous fire occurred, which destroyed a considerable portion of the mansion. The work of rebuilding was begun almost immediately under the direction of Mr. James B. Dunn, F.R.I.B.A., architect, Edinburgh, and the opportunity was taken to make a number of improvements. The whole of the south and west elevations were entirely redesigned and a new porte-cochere added. The domed entrance was destroyed by the fire, and the upper portion of the dome was entirely rebuilt and a new copper dome substituted for the former slated roof. A formal garden has also been laid out, an old disused lodge being rebuilt in a central position and arranged as a tea-house. All this work has been carried out from the designs of the architect and under his direction and supervision.

The stone used for the rebuilding of the mansion-house was from "Blackpasture" Quarry, Northumberland. The stone for the garden walling and random paving was from "Hailes" Quarry, near Edinburgh, mixtures of white, grey, and pink being used. The tower shown in the distance is used as a water-tower in connection with the mansion-house, there being three separate supplies, the water storage being collected into large iron tanks.

Haggerston Castle: Doorway to Drawing-Room.

Mr. J. B. Dunn, F.R.I.B.A., Architect.

This tower was added at the same time as Norman Shaw carried out the other alterations.

The principal contractors engaged on the work were the following:—Mason and joiner work, Messrs. Robert Hall & Co., builders, Galashiels; slater work, Messrs. Wm. Anderson & Son, Edinburgh; plumber work, Mr. Hugh Weir, Edinburgh; plaster work, Mr. Leonard Grandison, Peebles; ornamental plaster ceilings, Mr. George P. Bankart, London; heating, Messrs. W. Richardson & Co., Darlington; structural steel work, Messrs. Redpath, Brown, & Co., Ltd., Edinburgh; finishings of main staircase and other panelling, Messrs. Scott Morton & Co., Edinburgh; panelling of Main Hall, Messrs. John Taylor & Sons, Ltd., Edinburgh. Mr. Alexander Auld acted as clerk of works throughout.

BOOKS RECEIVED.

HALIFAX, A COMMERCIAL AND INDUSTRIAL CENTRE. Edited by Geo. P. Wadsworth. (London: Sells, Ltd. Price 2s. 6d.)

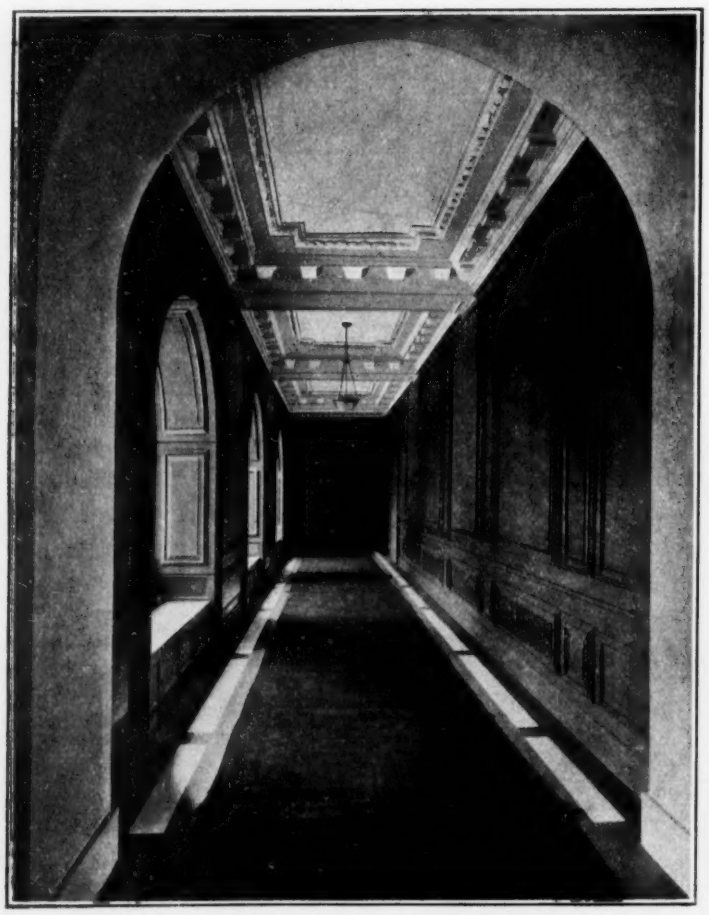
STABILITY OF MASONRY AND OTHER STRUCTURES SUBJECT TO THE PRESSURE OF EARTH AND WATER. By Ernest H. Sprague. Illustrated. (London: Scott, Greenwood, & Son. 4s. net.)

FIFTY YEARS AGO.

Telegraphic Progress.

THE Atlantic telegraph cable is now on its way, in the *Great Eastern*, to be laid down. A comparison between this cable and the last may here be briefly made. The last had seven wires, and this has seven; but there the resemblance ceases. The seven wires in the one case weighed 107 lb. per nautical mile; in this instance, 300 lb. The insulation in 1858 was by three layers of gutta-percha, weighing 261 lb. per knot; the present insulator is in four layers, weighing 400 lb. The external covering then was by eighteen strands of the spiral wires; now it is by ten solid wires of homogeneous iron, each wire "served" with Manila yarn, saturated with a preservative compound. The weight in air then was 20 cwt. per mile; this is 35¾ cwt. The weight in water was 13·4 cwt. per mile; now it is 14 cwt. The breaking strain was 3¼ tons; now it is 7¾ tons; and while the strength of the former cable was 2·05 times the strength required for the deepest water, this is 4·64 times stronger than is deemed absolutely necessary. Finally, the length shipped for 1858 was 2,174 nautical miles; now it is 2,300 knots.

[*** We give the above extract from the *Builder* of July 22, 1865.]



[*Photo: Donald Scott, Edinburgh.*

Haggerston Castle: Bedroom Corridors.

Mr. J. B. Dunn, F.R.I.B.A., Architect.

REINFORCED CONCRETE.

REINFORCED CONCRETE REGULATIONS.

THE Report of the Building Acts Committee, considered at a meeting of the London County Council on July 6 last, contained recommendations as to the regulations for buildings wholly or partly of reinforced concrete, and amended regulations were put forward which it is proposed shall be submitted to the Local Government Board for consent.

Under sect. 23 of the London County Council (General Powers) Act, 1909, authority was conferred on the Council to make regulations with respect to buildings wholly or partly in reinforced concrete, and on November 21, 191[illegible], regulations were prepared and submitted to the Local Government Board for allowance. After prolonged negotiations a revised draft of the regulations was prepared, and on June 24, 1913, regulations were made in accordance with this draft. These revised regulations were again sent to the Board, and the four institutions mentioned in the General Powers Act—viz., the Institution of Civil Engineers, the Royal Institute of British Architects, the Surveyors' Institution, and the Concrete Institute—were notified of the Council's intention of applying to the Board for consent.

Further negotiations have since taken place with the Board and the institutions above mentioned, and many suggestions have been put forward, a number of which it is proposed to adopt, and the outcome is found in what may be termed the third set of regulations. The Royal Institute of British Architects has placed on record its opinion of the great value of the regulations to architects in London and throughout the whole of the empire, and there is not likely to be any opposition to the regulations as now proposed, owing to the various Institutes having fully considered all the clauses and put forward all the suggestions necessary, and it is probable that in due course this third set will come into force.

As now amended, the regulations are considered less onerous than those previously made by the Council, and it is further stated that if, as a result of experience gained during the next few years, it should be found that alterations are desirable, there should be no difficulty in making modifications.

The scope of the regulations is still limited to the construction of buildings in which the loads and stresses are transmitted through each story to the foundations by a skeleton framework of reinforced concrete together with the party walls—if any—and it has not been amended to deal with cases where internal division walls or piers of brick could be utilised for carrying a portion of the loads, as has been suggested should be done by some engineers. The clause relating to the construction of floors and stairs has been extended to include roofs, and it states "nothing in this regulation shall prevent the use of wood-framing, boarding and battens in the construction of roofs."

In the data to be used for the purposes of the regulation, clauses 7 to 24, both inclusive, deal with the loads to be calculated for in the different classes of building, and some revisions have been made in these. The floor loads are stated at the same amounts, but the words, "Other similar purposes," have been introduced in each case to ensure every type being covered. Stairs and landings must be calculated to carry a distributed dead load of at least 120 lb. per square foot, but each step shall be capable of safely supporting a concentrated load at any point of not less than 300 lb. A new clause has been added which deals with the angle of dispersion, and in this it states that for calculating the resistance moment the angle of a point load through hard filling and concrete shall not be taken at more than 45 deg. from the vertical. With regard to the weight of reinforced concrete the clause dealing with this has been revised, and it now states that this shall not be taken at less than 144 lb. per cubic foot, measured over finished surfaces and including the finishing materials. This revision is advantageous to the designer, as it will simplify matters in the calculations and he can deal with the total weight of the finished floor or other part of the structure instead of taking the reinforced concrete at 150 lb. per cubic foot and adding the actual weight of the finishing materials as before proposed. In the original regulations the ratio of span to depth of a beam was limited by a clause which stated that the span should not exceed twenty-four times the effective depth unless the calculated deflection is less than $\frac{1}{300}$-part of the span; and the second regulations stated that "the span shall not exceed twenty times the effective depth of the beam"; but this has now been altered to say that the ratio of the span to the effective depth shall not exceed the lesser of the following ratios :—

$$20 \times \frac{\text{tensile stress in regulation 43}}{\text{actual maximum tensile stress}} \text{ or}$$

$$20 \times \frac{\text{compressive stress in regulation 42}}{\text{actual maximum compression stress}}$$

and this is obviously an improvement from the point of view of the designer. The clauses dealing with the bending moments to be provided for in the previous regulations have been severely criticised, particularly those relating to continuous beams, and in consequence some alterations have been made in clause 35 which deals with this part of the subject; but the most important point of all is the introduction of a new clause which states that :—"Notwithstanding anything in regulation 35, beams may be designed for the exact positive and negative bending moments which will occur at every cross-section, whether all the spans be loaded or alternate, or any of the spans be unloaded." This, of course, is only logical and fair, as it is quite obvious that if the bending moment is accurately calculated at all points, as it can be, then this, and this only, is to be provided for, and no regulations can govern or control the actual bending moments to be resisted. The clauses relating to the bending moments to be provided for in the case of slabs have been revised in a similar manner to those relating to beams, and the whole question has been dealt with thoroughly owing to the criticisms made by the members of the Institutes consulted.

The reinforcement is specified to be carried beyond the points of contraflexure under any condition of loading by a length at least equal to half the effective depth of the beam, and this is a variation on the previous regulations.

The table of working stresses, as now given for concrete, has been considerably revised, and due increase in the stresses allowed for richer mixtures has been made and the table may now be considered a fair one. Several of the remaining clauses under the heading of "Working Stresses" have been revised, and, generally speaking, the revision has been to make them more lenient. The table dealing with the grip or adhesion length given in the previous regulations has been omitted and a general clause introduced which ensures the length being sufficient to keep the stresses within the limits allowed; and other slight modifications have been made in the case of bars having a mechanical bond.

Some important alterations have been made in the clauses relating to compressive reinforcement in beams and shear reinforcement, and these will be welcomed by all designers; while the effective depth of slabs required as the minimum has been reduced from 4 in. to 3 in. The rules relating to the breadth of slab that may be taken as forming the flange of a tee beam have been varied to allow more latitude to the designer, and a clause has been introduced which deals with ell beams; while certain alternative formulæ have been given and additional clauses added, the chief of the latter having reference to the case of a beam supported at its end by a transverse beam. In the section devoted to struts many alterations have been made, some of which are very important, and generally the conditions are not so stringent as before. As an example it may be said that in the previous rules three methods were given for forming the joints in the vertical reinforcement, but this has now been revised, and the one clause dealing with the method states that an overlap shall be provided at least equal to twenty-four times the diameter of the upper bar. In the previous regulations it stated that in cases where there is a change in section the vertical bars shall have an overlap at least equal to forty times the least diameter of the thicker bar, and it will be evident that this is an important change. This is only given as one example, and it is impossible to deal here with all the modifications that have been made in this section, but it is sufficient to say that the modifications are numerous. In the section devoted to the construction of walls the only alterations made apply to the use of hollow concrete blocks, and here some changes have been made.

The sections on foundations, protection, cement, sand and coarse material remain practically unaltered, but the table dealing with the proportions and ultimate resistance of concrete has been altered in form, and this is an improvement. The notes on steel remain unchanged, and practically the only alteration under the heading of testing is that dealing with deflection, and this shall not exceed $\frac{1}{300}$ of the span, when the span is twenty times the effective depth, and the beam or slab is freely supported and uniformly loaded and subject to the permissible working stresses. The only alteration in the section devoted to centering is the introduction of the term "Formwork," which is given as the alternative to the term "centering"; and in the last section, which deals with the workmanship, one or two variations have been made, and these deal with concrete affected by frost, and wood embedded in concrete.

The total number of clauses in the regulations as now given is 188, whereas in the second set, which have been superseded or rescinded by the Council, the total number was 164.

Generally speaking, these last regulations are a great improvement on the previous ones, as, while they contain all the essential conditions to ensure satisfactory work, they are not so stringent, and it is quite unfair to impose unnecessarily hard rules because the material has not been in general use for a great number of years, when there is plenty of practical evidence as to its satisfactory nature, and it has been studied and pursued by designers, who possess undoubted knowledge in scientific building. The many revisions and improvements that have been effected are due almost entirely to the efforts of the Institutes mentioned in the General Powers Act, who have been working hard to further the interests of the architectural and engineering professions generally, and credit must be given to them for the way in which they have accomplished their task.

SLABS IN REINFORCED CONCRETE.

By LEONARD LEEPER, B.Eng., A.M.Inst.C.E.

FLOOR slabs in reinforced concrete will be calculated for as regards their strength in the same manner as rectangular beams.* In this case the width of the beam is the width of a strip of the slab, and is conveniently assumed at 12 in. Consequently, the moment of resistance of a reinforced concrete strip 12 in. wide may be written by equations (9) and (10).

$$= 95{\cdot}04\ b\ d^2$$
$$= 95{\cdot}04 \times 12 \times d^2$$
$$= 1140{\cdot}48\ d^2 = 1140{\cdot}5\ d^2 \text{ (say)} \quad \text{.....(14)}$$

Bending Moments.

The exact determination of the maximum bending moment which occurs in the central strip of the slab offers some difficulty; its value depends on the proportions of the slab itself and on the reactions along the supporting edges.

For a square slab carrying a uniformly distributed load (Fig. 8) and reinforced in two directions at right angles, it is clear that all four edges support an equal share of the load. The bending moment at the centre of a slab or beam supported at two edges is equal to $Wl/8$; therefore the bending moment at the centre of a square slab supported along four

* See article in the *Builder*, January 2, 1914, on "Rectangular Beams in Reinforced Concrete," by the same author.

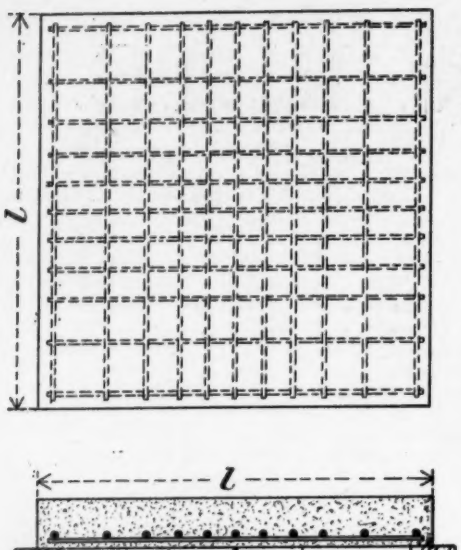


Fig. 8.

edges is equal to $Wl/16$. If, however, the square slab has its sides firmly fixed by being built into the supports, the bending moments on the central strip can be decreased to $Wl/12$ where two opposite sides only are fixed, and to $Wl/24$ where all four sides are fixed.

In the case of rectangular slabs uniformly loaded and reinforced in two directions at right angles (Fig. 9), it is clear that the supports opposite the shorter span—that is, in the direction of the width b of the slab—carry the greater proportion of the load, a proportion which increases with the length l of the slab. When the length of the slab is equal to twice the breadth the effect of the end supports is sufficiently small to be neglected, and the whole load may be regarded as carried by the two sides of the slab.

Thus the problem is to find the permissible reduction of the maximum bending moment on the central strip of a slab across its length due to the support at its sides between these two limits—the square slab where each edge supports an equal share of the load, and the rectangular slab with the length equal to and greater than twice the breadth, where the effect of the end supports is neglected.

Grashof-Rankine Rule.

These reduction factors in the majority of present-day designs are obtained by means of the Grashof-Rankine Rule. This formula is recommended in the R.I.B.A. report, where it is also stated that the reasoning by which these factors are obtained is not quite satisfactory, since other writers give other values.

They assume that the maximum bending stress on a slab is at the centre, where there are two principal stresses on planes normal to each other, these planes coinciding with the major and minor axes of the slab. Their rule is as follows: let l = the length of the slab and b = the breadth of slab (where l is equal to or greater than b). Then calculate the bending moment on the slab (disregarding the end supports) as a beam supported or fixed at the sides only, of a span b under the total load on the span. Multiply their bending moment by the factor (F_b) for the span b in the table below to allow for the effect of the end supports. The result is the actual bending moment on the long axis of the slab. In a similar manner the stress on the plane formed by the minor axis of the slab is found by assuming the slab supported or fixed at the ends and disregarding the effect of the side supports. The bending moment is calculated as if the slab were a beam of span l under the total load on the slab. This bending moment is reduced by the factor for the span l (F_l in the table below), and the result is the actual bending moment on the short axis of the slab.

When $\frac{l}{b}$ =	Grashof's and Rankine's Rule.	
	$F_b = \frac{l^4}{l^4 + b^4}$	$F_l = \frac{b^4}{l^4 + b^4}$
1·0	0·50	0·50
1·25	0·71	0·29
1·5	0·83	0·16
2·0	0·94	0·05

In order to facilitate the calculations, the factors F_b and F_l obtained for varying ratios of

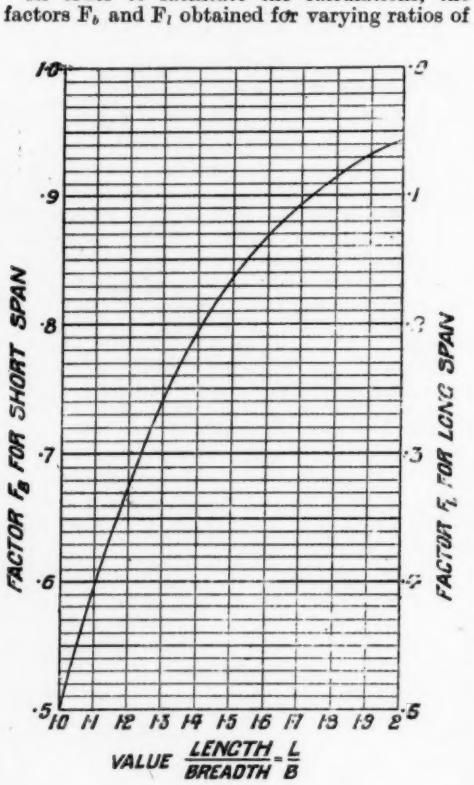


Fig. 10.

l/b can be plotted to scale on squared paper for future reference as shown in the figure (No. 10).

The abscissæ represent the proportions l/b of the slab, and the junction of the curved line with any ordinate gives the factor F_l where the ordinate is measured on the scale to the right of the figure for the slab proportions shown by the abscissæ for that point. In a similar manner looking to the scale on the left of the diagram, the factor F_b is obtained for a slab of the same proportions.

For example, if a slab be 6 ft. long and 4 ft. wide, the proportion $l/b = 6/4 = 1{\cdot}5$; carry the line marked 1·5 vertically upwards until it meets the curved line, then run from this point horizontally to the right and left and read the ordinates 0·16 and 0·83 for the factors F_l and F_b respectively. In a similar manner the reduction factors for any other slab proportions are readily obtained from the diagram.

Bending Moment at Centre of Slab.

As an example of the foregoing, suppose that a slab 8 ft. long and 5 ft. wide (Fig. 11) carrying an evenly distributed load of 200 lb. per square foot be supported on all four sides, and let it be required to calculate the bending moment at the centre of the span in both

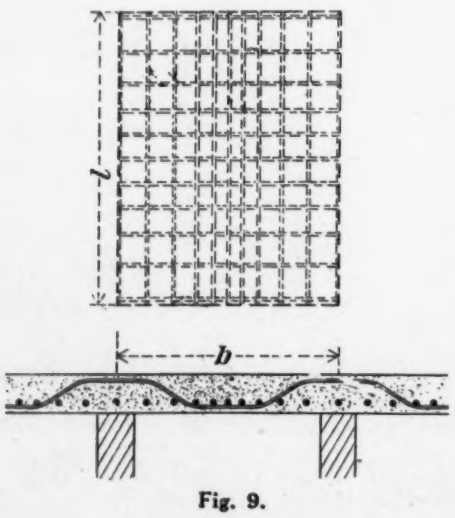


Fig. 9.

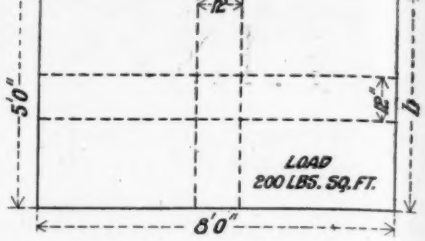


Fig. 11.

directions by considering a portion 1 ft. wide, first 8 ft. long and secondly 5 ft. long.

Here, by the above rule, we have:—

$$F_b = \frac{l^4}{l^4 + b^4} = \frac{8^4}{8^4 + 5^4} = \frac{4{,}096}{4{,}721} = 0{\cdot}867$$

$$F_l = \frac{b^4}{l^4 + b^4} = \frac{5^4}{8^4 + 5^4} = \frac{625}{4{,}721} = 0{\cdot}132$$

Or, by the graphical diagram (Fig. 10), since the slab length ratio $l/b = 8/5 = 1{\cdot}6$, we have, carrying the vertical line 1·6 up to meet the curved line, the values 0·13 on the right and 0·86 on the left for the factors F_l and F_b respectively. Taking a central strip of the slab 12 in. wide, we have:—

$b = 5 \times 12 = 60$ in.
$W = 200 \times 1 \times 5 = 1{,}000$ lb.

Thus the bending moment for the shorter span

$$= \frac{W\,b}{8} \times F_b = \frac{1{,}000 \times 60}{8} \times 0{\cdot}86$$
$= 7{,}500 \times 0{\cdot}86$
$= 6{,}450$ in.-lb.

The allowance, then, made in this case reduces the bending moment from 7,500 in.-lb. to 6,450 in.-lb.

Similarly for the longer span:—

$l = 8 \times 1 \times 12 = 96$ in.
$W = 200 \times 1 \times 8 = 1{,}600$ lb

and the bending moment on the central strip

$$= \frac{W\,l}{8} \times F_l = \frac{1{,}600 \times 96}{8} \times 0{\cdot}13$$
$= 19{,}200 \times 0{\cdot}13$
$= 2{,}496$ in.-lb.

In this case the bending moment is reduced from 19,200 in.-lb. to 2,496 in.-lb., a much greater amount than before, and is due to the fact that the edges of the shorter span must carry a greater proportion of the load than the edges of the longer span, and consequently the reactions are less and the bending moment reduced.

Practical Notes.

To complete the calculations for the design of the slab, the bending moments as determined above must be equated to the moment of resistance of the slab as given by the equation (14) to determine the effective depth of the slab. Since there are two bending moments, one along each axis of the slab, there will be two effective depths. Again, the shorter span has the greater bending moment, and is consequently used to find the deeper effective depth of the two; the effective depth of the longer span, where the bending moment is smaller, is then taken as the distance from the centre of the longitudinal bars (which are placed immediately over the transverse bars or lower bars) to the compressed edge of the slab (see Figs. 12 and 13). In all cases where the effective depth for the transverse reinforcement works out less than $3\frac{1}{2}$ in., the effective depth is increased up to this amount, as experience shows that this is the least depth which allows the bars to have the concrete properly packed around them. It might also be remembered that a floor slab should not be less than one-thirtieth of the span in thickness.

The amount of concrete cover to the underside of the slab which is required to protect

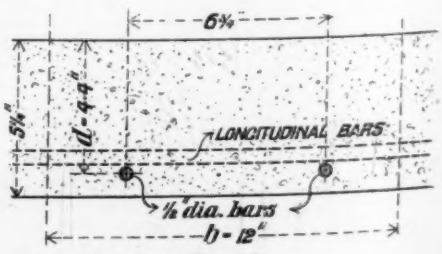


Fig. 12.

the bars from fire and oxidation recommended in the R.I.B.A. report is ½ in.

The least diameter of the reinforcing bars used in slabs for the main reinforcement is ¼ in., and any other reinforcement should not be less than ⅛ in. It is advisable to use the same diameter rod for both sets of reinforcement where possible, on account of uniformity of design. The distance apart of the reinforcing bars centre to centre should not be less than 1 in. or more than 12 in. The resistance moment of a section of the concrete slab necessary to resist the varying bending moments across it is allowed for in two ways, (1) by using bars of the same size across the section and altering the spacing; (2) by keeping the spacing uniform and varying the size of the bars. The former method is to be preferred on account of the less likelihood of mistakes arising on the works, etc. For slabs supporting uniform loads, the bending moments can be conveniently considered as homogeneous over the middle third of the span (Fig. 8), and decrease towards the outer edges. Thus with bars of uniform size the spacing over the middle third will be equal, and may be gradually increased towards the edges provided that the spacing there is not made greater than three times that at the centre of the span. For slabs (Fig. 9) fixed or continuous over one or more supports, the bending moment at the supports must be calculated, and reinforcement provided at the upper surface of the slab to resist the tensional stresses which will be developed there. Some of the bars placed in the lower edges of the slab may be bent up and over the supports for this purpose. For the bending moment at the lower edges decrease to a negligible quantity at the supports, so that the number of bars which are required at the centre of the span can be decreased at the supports, and may be conveniently utilised in this manner with economy of design. The turning up of the lower bars over the supports also assists in the resistance to shear. In all cases of fixed beams it is advisable to draw the complete bending moment diagram by calculating its amount at several points along the span, and then the slab can be designed to resist the varying moment.

Numerical Example.

As a practical example of slab design, let it be required to determine the thickness and amount of reinforcement of a slab 10 ft. by 8 ft. supported on all four sides, and carrying a uniformly distributed load of 250 lb. per square foot in addition to its own weight. The stresses in the concrete and the steel are not to exceed 600 lb. and 16,000 lb. per square inch respectively.

Assuming a trial thickness of 6 in. for the slab, its weight at 150 lb. per cubic foot for a 12 in. strip along the shorter axis

$$= 8 \times 1 \times \frac{6}{12} \times 150 = 600 \text{ lb.}$$

The total load distributed along the strip over the 8 ft. span $= 8 \times 1 \times 250 + 600 = 2{,}600$ lb.

By the Grashof-Rankine rule, the bending moment reduction factors :—

$$F_b = \frac{l^4}{l^4 + b^4} = \frac{10^4}{10^4 + 8^4} = \frac{10{,}000}{14{,}096} = 0{\cdot}71$$

$$F_l = \frac{b^4}{l^4 + b^4} = \frac{8^4}{10^4 + 8^4} = \frac{4{,}096}{14{,}096} = 0{\cdot}29$$

Or, since the slab length ratio $l/b = 10/8 = 1{\cdot}25$, the values of the reduction factors are at once obtained from the diagram (Fig. 10), as previously explained. They are 0·71 and 0·29 for F_b and F_l respectively, and agree with the values as above determined mathematically.

The maximum bending moment across the width of the slab

$$= \frac{W\,b}{8} \times F_b = \frac{2{,}600 \times 96}{8} \times 0{\cdot}71$$

$$= 22{,}152 \text{ in.-lb.}$$

Equating this to the moment of resistance of the 12 in. strip of the concrete slab, we have, by equation (14)—

$$1{,}140{\cdot}5\ d^2 = 22{,}152$$

Therefore d, the effective depth—

$$= \sqrt{\frac{22{,}152}{1{,}140{\cdot}5}} = \sqrt{19{\cdot}42} = 4{\cdot}4 = 4\tfrac{1}{2} \text{ in. (say)}$$

Supposing that the diameter of the reinforcing bars is ½ in. and the cover ½ in., the total depth of the slab would be $4{\cdot}5 + \frac{0{\cdot}5}{2} + 0{\cdot}5 = 5{\cdot}25$ say) 5¼ in. thick. Thus the slab is assumed at too great a thickness. Suppose it to be reduced to 5¼ in. thick.

The weight of the 12 in. strip along the shorter axis of the slab at 150 lb. per cubic foot

$$= 8 \times 1 \times \frac{5{\cdot}25}{12} \times 150 = 525 \text{ lb.}$$

And the total load distributed along the strip over the 8 ft. span

$$= 8 \times 1 \times 250 + 525 = 2{,}525 \text{ lb.}$$

The maximum bending moment, then,

$$= \frac{W\,b}{8} \times F_b = \frac{2{,}525 \times 96}{8} \times 0{\cdot}71 = 21{,}513 \text{ in.-lb.}$$

And the effective depth by equation (14) gives :—

$$1140{\cdot}5\ d^2 = 21{,}513$$

Consequently $d = \sqrt{\frac{21{,}513}{1{,}140{\cdot}5}} = \sqrt{18{\cdot}86} = 4{\cdot}4$ in.

Choosing ½ in. diameter bars for the reinforcement, and allowing a cover of ½ in., the total depth of the slab $= 4{\cdot}4 + \frac{0{\cdot}5}{2} + 0{\cdot}5 = 5{\cdot}15$ $= 5\tfrac{1}{4}$ in. (say). Thus the depth of the slab can be correctly assumed at 5¼ in. thick.

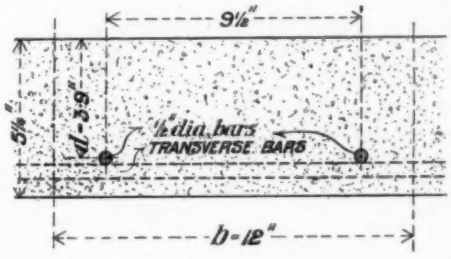


Fig. 13.

The area of the steel required for the 12 in. strip, using economical ratios of concrete and steel—

$$= 0{\cdot}00675 \times b\ d.$$
$$= 0{\cdot}00675 \times 12 \times 4{\cdot}4$$
$$= 0{\cdot}3564 \text{ sq. in.}$$

Using ½ in. rods of an area of 0·1963 sq. in., the number of bars required per 12 in. strip $= \frac{0{\cdot}3564}{0{\cdot}1963} = 1{\cdot}815$; that is, the rods must be placed $\frac{12}{1{\cdot}82} = 6{\cdot}6 = 6\tfrac{3}{4}$ in. (say) centres apart.

The transverse reinforcement, then, consists of steel rods ½ in. in diameter placed 6¾ in. centres apart at the centre of the span of the slab, and 4.4 in. in depth below the compressed edge (Fig. 12). The stresses developed in the steel and the concrete must now be checked

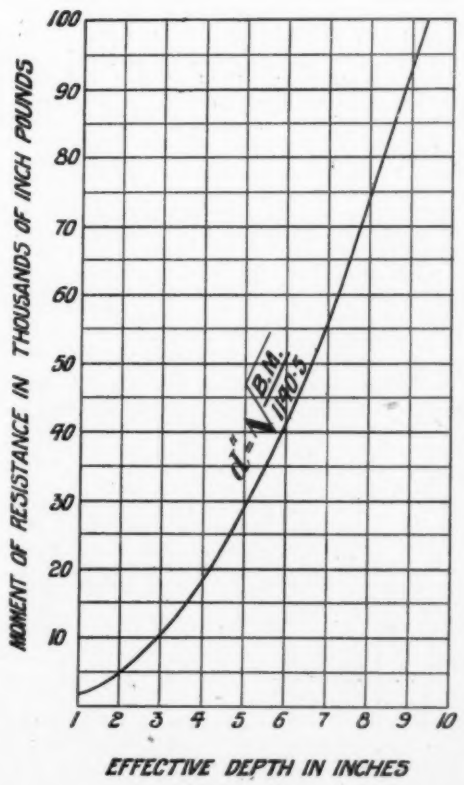


Fig. 14.

to make quite sure that they do not exceed the permissible limits. Since

$$r = \frac{\text{area of steel}}{\text{area of concrete}} = \frac{1 \times 0{\cdot}1963}{4{\cdot}4 \times 6{\cdot}75} = 0{\cdot}00662$$

substituting for this value in equation (2), we have for the neutral axis depth ratio :—

$$n_1 = \sqrt{(0{\cdot}00662)^2\,(15)^2 + (2 \times 0{\cdot}00662) \times 15} - 0{\cdot}00662 \times 15$$
$$= 0{\cdot}3572 = 0{\cdot}36 \text{ (say).}$$

Inserting the values for the given bending moment, and the known values of b, d, r, and n_1 in the equation (7), the intensity of stress on the steel—

$$t = \frac{21{,}300}{12 \times (4{\cdot}4)^2 \times 0{\cdot}00662\left(1 - \frac{0{\cdot}36}{3}\right)}$$
$$= 15{,}738{\cdot}8 \text{ lb. per square inch.}$$

Similarly the stress on the concrete by equation (8)—

$$c = \frac{21{,}300 \times 2}{12 \times (4{\cdot}4)^2 \times 0{\cdot}36\left(1 - \frac{0{\cdot}36}{3}\right)}$$
$$= 578{\cdot}7 \text{ lb. per square inch.}$$

Both stresses are well within the prescribed limits, so that the transverse reinforcement at the centre of the span has been satisfactorily designed.

The longitudinal reinforcement must now be taken into account. The weight of the 12 in. strip along the 10 ft. axis

$$= 10 \times 1 \times \frac{5{\cdot}25}{12} \times 150 = 656{\cdot}25 \text{ lb.}$$

And the total distributed load along the strip over the 10 ft. span

$$= 10 \times 1 \times 250 + 656{\cdot}25 = 3{,}156{\cdot}25 \text{ lb.}$$

The maximum bending moment

$$= \frac{W\,l}{8} \times F_l = \frac{3{,}156{\cdot}25 \times 120}{8} \times 0{\cdot}29 = 13{,}729{\cdot}7$$
$$= 13{,}730 \text{ (say) in-lb.}$$

The longitudinal bars will be placed immediately on the top of the transverse bars so as to obtain as big a leverage as possible. Using ½ in. diameter bars as before, it is clear that the effective depth $= 4{\cdot}4 - 0{\cdot}5 = 3{\cdot}9$ in. The question, then, is to determine the area of steel required having given the effective depth.

It has been previously shown that the area of the steel may be written $A_t = r.b.d.$ Substituting for r, b, and d in the equation (7), the resistance moment for the steel may be written :—

$$b\,d^2\left[t\,r\left(1 - \frac{n_1}{3}\right)\right]$$
$$= A_t\,d\left(1 - \frac{n_1}{3}\right)t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (15)$$

Substituting in this equation for d, n_1, and t we have for the area of steel required :—

$$A_t = \frac{13{,}730}{16{,}000 \times 3{\cdot}9\left(1 - \frac{0{\cdot}36}{3}\right)} = 0{\cdot}25 \text{ sq. in.}$$

Using bars ½ in. in diameter as before, we see that for each 12 in. strip $\frac{0{\cdot}25}{0{\cdot}1963} = 1{\cdot}273$ bars are required; that is, the bars must be spaced $\frac{12}{1{\cdot}273} = 9{\cdot}4 = 9\tfrac{1}{2}$ in. (say) centres apart.

Therefore the longitudinal reinforcement consists of steel bars ½ in. in diameter placed 9½ in. centres apart and 3·9 in. in depth below the compressed edges of the slab (Fig. 13).

Checking the stresses developed as before, the ratio of the steel to the concrete—

$$r = \frac{1 \times 0{\cdot}1963}{3{\cdot}9 \times 9{\cdot}5} = 0{\cdot}0529$$

Substituting for this value of r in the equation (2), the neutral axis depth ratio—

$$n_1 = \sqrt{(0{\cdot}00529)^2 \times (15)^2 + 2 \times 0{\cdot}00529 \times 15} - 0{\cdot}00529 \times 15$$
$$= 0{\cdot}326$$

Therefore, from equations (7) and (8), as before, we have the stress on the steel—

$$t = \frac{13{,}730}{12 \times (3{\cdot}9)^2 \times 0{\cdot}00529\left(1 - \frac{0{\cdot}3268}{3}\right)}$$
$$= 15{,}957{\cdot}6 \text{ lb. per square inch}$$

and the stress on the concrete—

$$c = \frac{13{,}730 \times 2}{12 \times (3{\cdot}9)^2 \times 0{\cdot}3268\left(1 - \frac{0{\cdot}3268}{3}\right)}$$
$$= 516{\cdot}6 \text{ lb. per square inch}$$

so that the stresses on both materials are within the prescribed limits.

Having designed the size and spacing for the bars in the central strips, the spacing of the bars may be increased towards the supporting edges where the bending moments decrease.

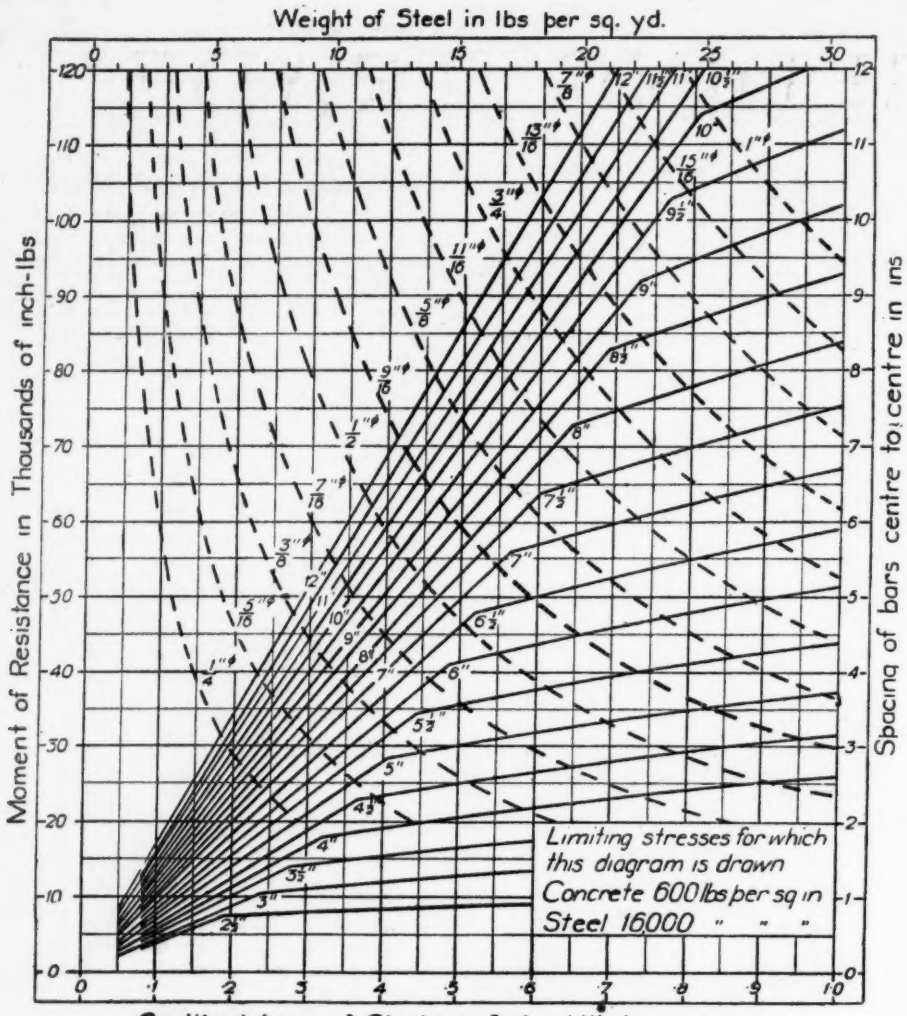

Weight of Steel in lbs per sq. yd.
Moment of Resistance in Thousands of inch-lbs
Spacing of bars centre to centre in ins
Sectional Area of Steel per foot width in sq. ins.
Limiting stresses for which this diagram is drawn
Concrete 600 lbs per sq in
Steel 16000 " " "

Fig. 15.

The procedure will be the same as described above, and needs no further description.

Graphical Diagrams.

In actual designing the calculations may be considerably shortened by using graphical diagrams. For instance, the equation (14), which determines the effective depth of the slab for various bending moments, can be plotted as a curve shown in the figure (No. 14). The abscissæ give the effective depth in inches, and the ordinates the resistance moments in thousands of in.-lb. from 1 to 100. The junction of any horizontal line with the curve gives the moment of resistance corresponding to the effective depth shown by the vertical line through the same point as calculated by the equation (14). For instance, taking a bending moment of 70,000 in.-lb., and carrying the line horizontally to meet the curve and then running vertically downwards through this point, the effective depth is 7·8 in.; and so on for the various bending moments shown.

The above diagram (Fig. 15) is invaluable as a help to slab design. It is taken from that excellent little work "Everyday Uses of Portland Cement," published by the Associated Portland Cement Manufacturers Ltd., who have kindly accorded their permission for the reproduction of their drawing in these pages. The ordinates represent the resistance moment in thousands of in.-lb. from 1 to 120. Choosing a given bending moment of 60,000 in.-lb. (say), run this line horizontally across till it meets one of the inclined lines which give the effective depth in inches, suppose to the one marked 8 in. Taking a line through this point vertically downwards, the sectional area of the steel to be used (0·53 sq. in.) for a 12 in. strip of the slab is determined, or, taking the line vertically upwards, from the same point the weight of the steel 15·2 in.-lb. per yard square is obtained.

Again, supposing that it is decided to use round bars of $\frac{5}{8}$ in. diameter for the reinforcement, running up from the same point till the dotted line marked $\frac{5}{8}''$ ϕ is met, and then running horizontally, the spacing of the bars centre to centre is seen to be 7 in.

As an example of the use of these graphical diagrams consider the numerical example just given. For the transverse reinforcement the maximum bending moment was found to be 21,513 in.-lb. Locating this moment in the left-hand margin of the figure (No. 14), the effective depth is seen to be 4.4 in., and agrees with the depth previously determined. Using the same diagram (Fig. 15), the junction of the bending moment of 21,513 in.-lb. and the effective depth of 4·4 in. is seen to lie between the space 4 in. and 4½ in., and if carried vertically downwards gives the sectional area of the steel per 12 in. strip as 0·36. Running the same point up to meet the line marked $\frac{1}{2}''$ ϕ, the spacing of the bars centre to centre is seen to be correctly designed at 6¾ in. For the longitudinal reinforcement the maximum bending moment is 13,730 in.-lb., and the effective depth is 3·9 in. Locating the junction of these two in the same figure the area of steel required is correctly taken at 0·25 sq. in., spaced 9½ in. centres apart.

In this manner graphical diagrams may be utilised to check the mathematical portions of reinforced concrete designs with great effect. They also are invaluable for trial designs, and well repay the trouble and time expended in drawing them on account of the security their use affords for checking calculations.

Sheer Stresses.

As in the case of singly reinforced beams, experience shows that floor slabs do not require any provision to be made as regards shear stress. In the present example the maximum shear at the supports

$$= \frac{W}{2} = \frac{2,525}{2} = 1,262{\cdot}5 \text{ lb. at the ends of the 8 ft. span}$$

$$= \frac{W}{2} = \frac{3,156{\cdot}25}{2} = 1,528{\cdot}125 \text{ lb. at the end of the 10 ft. span.}$$

Substituting in equation (12), we have for the shear stress—

$$s = \frac{1,262{\cdot}5}{12 \times 4{\cdot}4\left(1 - \frac{0{\cdot}36}{3}\right)} = 27{\cdot}1 \text{ lb. per square inch at the ends of the shorter span}$$

$$s = \frac{1,528{\cdot}12}{12 \times 3{\cdot}9\left(1 - \frac{0{\cdot}32}{3}\right)} = 36{\cdot}5 \text{ lb. per square inch at the ends of the longer span.}$$

These values are well inside the stress allowed on concrete.

LAW REPORT.

CHANCERY DIVISION.
(Before Mr. Justice SARGANT.)

Ancient Light Disputes: Charlewood and others *v.* Boots Cash Chemists (Lancashire) Ltd.

THIS was an action by Mrs. Elizabeth Charlewood, Mrs. Mary Milnes, and Miss Jessie Knowles, of No. 8, Neville-street, Southport, proprietors of a potted-meat business, for an injunction to restrain the defendants from interfering with the plaintiffs' ancient lights and damages for alleged trespass.

Mr. Grant, K.C., and Mr. Owen Thompson appeared for the plaintiffs; and Mr. Mark Romer, K.C., and Mr. Bischoff for the defendants.

Mr. Grant said the main street in Southport was Lord-street, which was an extremely fine street. Southport had the advantage of having been laid out on a system which was really an anticipation of the town-planning system, and Lord-street was the only street he knew in this country which at all approached the Continental boulevard. Neville-street ran from Lord-street to the seashore, where it abutted on the pier, and was the main avenue of communication between Lord-street and the sea and the central portion of the promenade, which were the attractions which the Corporation had put down in order to compensate for the retreat of the sea. Plaintiffs' premises were in Neville-street, a few doors from Lord-street, and therefore in a good position. They had carried on the business in the old-fashioned style. They occupied the premises under a lease granted in March, 1854, for sixty-four and a half years, and the Scarisbrick Trustees were the freeholders. The defendants bought premises running from Lord-street to Stanley-street, and later other property from there to Neville-street, so that they surrounded the plaintiffs' property. They began building operations in May, 1914, and the result of these was that the plaintiffs had been put in a well, so far as light was concerned. Counsel pointed out that the defendants' architect had deliberately ignored the plaintiffs' request for particulars of the defendants' intentions.

His Lordship said he was not inclined to grant a mandatory injunction for the short period the plaintiffs' lease had to run; but he was willing to grant one on the terms of the defendants' undertaking previously given not to raise their building higher than it was at present. All that remained in the action was the amount of the damages.

Mr. Romer, on behalf of the defendants (after a consultation with Mr. Grant), offered £200 as damages. He said he did so because of the position in which he had been placed owing to a misunderstanding as to plans.

Mr. Grant accepted the offer, which included the payment of costs, in addition to damages and an admission that the plaintiffs' lights were ancient.

His Lordship, in the result, made an order in these terms.

BUSINESS PREMISES, HATTON-GARDEN, E.C.

Additional premises for Messrs. Baird & Tatlock, Ltd., scientific instrument makers, are in course of erection at 15 and 16, Cross-street, Hatton-garden, E.C., being extensions of the firm's place of business, 14, Cross-street and 21, Hatton-yard. The architect is Mr. Charles Burton, A.R.I.B.A., Gray's Inn-place, Gray's Inn, W.C. The general contractor is Mr. W. Nash, Crown Works, Deptford, S.E., and the steelwork is by Messrs. H. Young & Co., Ltd., Nine Elms Works, Vauxhall, S.W. It is a fire-proof structure of steel and concrete, with asphalt roof. The Peterhead granite base and entrance (Messrs. Fenning & Co., Palace Wharf, Hammersmith) is surmounted by artificial stone (the Empire Stone Company, Ltd., Strand, W.C.), Ibstock bricks, and Swedish grey-green tiles (Messrs. Ernest Mathews & Co., Devonshire-square, E.C.). The asphalt is by the Limmer Asphalte Paving Company, Ltd., Caxton House, S.W.; the gunmetal casements are by Messrs. W. James & Co., Willesden Junction, N.W.; the electric lighting work is by Messrs. Donnison, Sillem, & Co., Great Portland-street, W.; the armoured doors are by Messrs. Mather & Platt, Ltd., Queen Anne's-chambers, S.W.; the sanitary work is by the City Iron Company, Upper Thames-street, E.C.; the lift is by Messrs. Aldous & Campbell, Ltd., Lower Bland-street, S.E.; the wood-block flooring is by Messrs. Burke & Co., Rathbone-place, W.; the pavement lights are by the British Luxfer Prism Syndicate, Ltd., Hill-street, Finsbury, E.C. In addition to the new premises in Cross-street, the Hatton-yard building is being raised one floor, also under the architectural guidance of Mr. Burton.

THE BUILDING TRADE.

MANCHESTER, SALFORD, AND DISTRICT BUILDING TRADES EMPLOYERS' ASSOCIATION.

WE take the following from the fourteenth annual Report of the Manchester, Salford, and District Building Trades Employers' Association :—

Organisation and Membership.

Whilst the Committee cannot record a large increase in membership for the year, they are pleased to note that fourteen new firms have been admitted during the year, making the total membership to date 293.

Relations with Operatives.

The relations between the Association and the various operative unions on the whole remain satisfactory, and very few regular notices for advances in wages and alterations to working rules have to be recorded for the year. Owing, however, to the increased cost of living consequent upon the war a number of societies have thought fit to make application for war bonuses during the continued high prices of commodities. In addition to these demands applications for increases and alterations to working rules have been considered from the electricians, concretors, slaters, bricklayers, plumbers, and slaters' labourers.

Demarcation of Trades.

Many disputes arising under demarcation of trades have been reported during the year, and there is no doubt that some effort will have to be made to definitely define the work of each particular trade if peace is to be expected in the execution of contracts. A national effort is being made at the present time to form Demarcation Committees representative of all trades, and it is hoped that this will be the means of bringing about peaceful terms with the various sections of trade.

Objectionable Contract Conditions.

Several cases of objectionable conditions of contract sought to be imposed upon employers have been brought to the notice of the Association. Upon attention being called thereto the Association have been successful in getting the objectionable clauses removed and fair conditions substituted.

Education Committee Contracts.

As a result of negotiations between the Association and the Manchester Education Committee, the Association was invited to send a deputation to meet the Education Committee to discuss with them the reason why they could not secure a fair number of competitive tenders from local contractors, and also why their schools were costing so much to build as compared with formerly. The full position was placed before the Education Committee by members of the Association, with the result that it was felt that some improvement would be made to remove the difficulties indicated. So far, however, nothing tangible has resulted from the interview except that the Committee now invite separate tenders for all trades on all occasions.

Municipal Trading.

The increasing employment of municipal departments in the execution of building and engineering contracts has received the careful consideration of the Committee, and a Vigilance Committee has been appointed to watch the additional powers which might be sought by the Corporation for extending their present limitations in regard to municipal trading.

Co-operative Societies and Building Contracts.

Several important building undertakings by various co-operative societies have been in the market during the year. In one or two instances the "C.W.S. Buildings Department" have not been in competition, but in the majority of cases such has been the case. The resolution adopted in September, 1913, calling upon members to refrain from tendering in competition when the "C.W.S. Buildings Department" were known to be tendering has been generally observed, except in one case, when two members, whose attention had been called to the matter prior to tenders being sent in, broke faith with the Association. They were called before the Committee for an explanation, which resulted in the resolution being amended and considerably strengthened so that no member can misunderstand same. The resolution now reads as follows :—"That this Association calls upon its members to refuse to tender for any co-operative societies' work when the C.W.S. Buildings Department is in competition."

Architects' Certificates.

Several cases have been brought before the Association of the unreasonable withholding of certificates by architects. The question is a very vexed and complicated one, but will have to be taken up seriously in the near future.

Belgian Building Trades Employers' Relief Fund.

An appeal has been made to members to aid distress amongst the building trade employers of Belgium who have had to seek refuge in this country in consequence of the war. At the present time the National Federation of Building Trades' Employers have under their charge a number of contractors and their families who, in consequence of invasion by the enemy, have practically lost all they possessed. It was not thought desirable that these unfortunate contractors should be left to seek relief from the various public charities, which have been so handsomely subscribed to, hence this appeal to the trade.

Treasury Restrictions on Borrowing by Local Authorities.

Attention is drawn to the action taken by the Treasury to restrict the capital issues by local authorities within the narrowest limits, and advising that the inception of new works, except such as are of pressing necessity either for reasons of public health or on account of war requirements, should be avoided.

Members who are requested by public authorities or private clients to suspend works in progress, or works for which contracts have been signed but not actually commenced, are urged to see that they are adequately protected under the proposed terms of postponement against increases of wages or in cost of materials. The question of compensation may also arise under certain circumstances, also consideration for materials ordered and payment of retention money.

TEES-SIDE PLUMBERS' WAGES.

The operative plumbers recently gave their employers notice for an advance in wages of 1d. per hour—10d. to 11d. According to agreements the question came before the Conciliation Board, who were unable to come to a decision. At the unanimous request of the Board, Mr. S. E. Burgess, Borough Surveyor of Middlesbrough, undertook to act as arbitrator. He has now given his decision to the effect that the wages remain unchanged. Mr. Burgess pointed out that the request was for an advance of wages, not a war bonus, and he had considered the question on those lines. The decision affects Middlesbrough, Stockton, and the Hartlepools.

COUNCIL SCHOOLS, HILLSBOROUGH, SHEFFIELD.

The new Council schools at Marlcliffe-road, Hillsborough, Sheffield, were opened by the Lord Mayor on the 13th inst. The site of about 2 acres is situated on sloping ground with open surroundings. Accommodation is provided in two departments for 457 infants and 436 senior scholars, space being left on the site for the erection of a future block. Each department contains eight classrooms and assembly hall, the latter being of minimum size, but capable of extension for large assemblies by including two adjoining classrooms, separated by folding partitions. The accommodation also includes combined domestic subjects and manual instruction centres, medical inspection rooms, and caretaker's house. The building has been erected at a cost of £14,095 by Messrs. Dawson & Jones, Ltd., contractors, Sheffield, from the designs of the City Architect, Mr. F. E. P. Edwards, F.R.I.B.A.

PROPOSED NEW BUILDINGS AND OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations :—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; L.G.B. for Local Government Board; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

ABERAYRON.—The R.D.C. have passed plans of a residence at Penlan, Llanon, for Dr. Lewis, Llanon.

Aldershot.—Extension of Wellington Works, for Messrs. Gale & Polden.

Amersham.—Plans passed by R.D.C. :—House, Holmer Green, Mr. A. W. Nash; house, Grimsdell-lane, Amersham, Mr. S. Norman; stable and coachhouse, The Village, Penn, Mr. F. Perfect; house, Grimsdell-lane, Mr. A. Woodley

Ampthill.—Plans passed for cowshed at Glebe Farm, Aspley Guise, for the Rev. T. F. Yule.

Ardsley.—Plans for eleven houses for Mr. B. S. Ledger off Wombwell-road, and of twelve houses for Mr. G. H. Mellor, Measboro' Dyke, have been passed by the U.D.C.

Ashbourne.—Plans passed by the U.D.C. :—Alterations and additions to The Laurels, for the Nestle and Anglo-Swiss Condensed Milk Company, and to premises in St. John-street, for Messrs. W. H. Smith & Son.

Atchem.—Messrs. Bond & Evans have purchased a site opposite the proposed works of Messrs. Alley & McLellan, on which they propose to erect cottages. The R.D.C. have decided that before they will sanction expenditure for water and sewerage, they must have a proper plan of the whole area to be developed.

Ayrshire.—The Northern District Committee of Ayrshire C.C. have granted the following linings :—Workmen's houses at Bankhead, Dreghorn, for Messrs. J. & R. Howie, Ltd., coal agents, Dreghorn; alterations on Morishill House, Beith, for the agents of the proprietor, Messrs. Murdoch & Loudon, writers, Ayr; stationmaster's cottage at Brackenhills, Dalry, for Lanarkshire and Ayrshire Railway Company; alteration at Bourtreehill House, Irvine, for Mr. Robert Kermeth, coalmaster, Dreghorn; addition to house, Ryeside, Dalry, for Mr. David Campbell.

Bacup.—Additions to Beach Mill, for Messrs. J. Hoyle & Sons.

Barnes.—Plans passed by the U.D.C. for five houses, Observatory-road, Mortlake, by Mr. G. A. Gale.

Barnsley.—Plans passed by the T.C. :—West Riding Miners' Permanent Relief Society, new offices, Church-street; Mr. H. Roseveare, dwelling house, Cope-street; Mr. P. Dalby, cart shed, Bingley-street; Mr. W. S. Dodgson, additions to carriage works, Racecommon-road; Mr. J. Hellewell, two dwelling houses, Doncaster-road; Mr. F. W. Oxley, motor shed, Oakwell-lane; trustees of St. Paul's Mission Church, Barnsley, additions to club, Thorntree-lane; Messrs. Reynolds Bros., extension to garage, Peel-street; Mrs. McNichol, alterations to shop and house, Nos. 25 and 27, Duke-street; Mr. P. Dalby, four dwelling houses, Dobie-street. An inquiry has been held by the L.G.B. into the application of the T.C. to borrow £15,073 for an extension of the electricity undertaking.

Barrow-in-Furness.—Two houses, Roose-road, for Messrs. T. & J. Walker; six houses, Oxford-road, for Messrs. J. Neal & Co.; six houses, Roose-road, for Mr. R. Richardson; four houses, Roose-road, for Mr. A. Ingham; two houses, Hawcoat-lane, for Messrs. Page Bros.; six houses, Romney-road, for Mr. T. T. Dockerey; two houses, West-avenue, for Messrs Marsh & Atkinson.

Bedford.—Plans passed by the T.C. :—Three houses, Beechdale-road, for Mr. A. W. Hulett; four houses, Dudley-street, for Messrs. Jacobs & Burton; alterations and additions, 66, St. Loyes-street, for Mr. R. Hockliffe; nurses' scullery, the Workhouse, Kimbolton-road, for the Guardians.

Bexhill.—Plans passed by the T.C. :—Conversion of stable into motor garage and boiler house at rear of Castle Hotel (Mr. J. B. Wall), Mr. C. S. James; addition to 42, Western-road (Mr. J. B. Wall), Mr. T. Wallis; detached house, Cantelupe-road (Mr. J. B. Wall), Mr. E. Baker; detached houses (three), Clavering-walk and Westcliff-drive, Cooden Beach (Messrs. Tubbs, Messer, & Poulter), Earl De La Warr; detached house, Terminus-avenue (Mr. G. E. Maynard), Mr. H. P. Farnfield.

Bletchley.—Plans for four houses in Western-road and three cottages in Windsor-street have been passed by the U.D.C.

Bolton.—Seven houses, Stratford-avenue, for Messrs. Leigh Bros.

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* See also our list of Competitions, Contracts, etc., on page 76.

Bournemouth.—Plans passed by the T.C.:—Shop, Seabourne-road, for Mr. W. P. Lawrence; house, Queen's Park-drive, for Mr. E. G. Evans; two houses, Pine-road, for Mr. W. Morgan; two houses, Keswick-road, for Mr. L. Follett; one house, Shelton-road, for Mr. F. Golton; one house, Charminster-avenue, for Mr. P. E. Read; twenty-seven houses, Rolland and Green roads, for Mr. A. Barnes.

Bridlington.—A L.G.B. inquiry has been held into the application of the T.C. for approval of the appropriation of a site for a refuse destructor on land on the west side of the electricity works.

Bristol.—An application from Messrs. C. J. King & Sons to rent land at Avonmouth Dock on which to erect a pay office has been granted by the Docks Committee.

Chatham.—Plans passed by the T.C.:—Tea room and store in Hook-road, for Mr. Auger; additions to 194, High-street, for Mr. R. F. Brain.

Cheadle.—The plans of Mr. J. Middleton for five cottages in Wilmslow-road have been passed by the U.D.C.

Darlington.—Plans for a recreation-room at Carlbury Hall, for Mr. J. H. Pease, have been approved by the R.D.C.

Dorchester.—Two houses at Middle Farm, for the Duchy of Cornwall.

Dorking.—The U.D.C. have decided to improve High-street and Mill-lane.

Dundalk.—The design of Messrs. O'Callaghan & Webb, architects, South Frederick-street, Dublin, has been accepted for the new County Council offices. A very large number of designs were submitted, and the task of deciding was done by Professor Scott, Dublin.

Dunbar.—An inspection of the north wall of the New Harbour, Dunbar, has revealed considerable damage to a portion of the structure. The T.C. have decided to have the work of restoration carried out as quickly as possible.

Falmouth.—The T.C. have resolved to apply to the L.G.B. for sanction to borrow £320 to carry out Market Strand sewage scheme.

Fletton.—Plans for a factory for Mr. H. F. Atkins have been passed by the U.D.C.

Foleshill.—Plans passed by the R.D.C.:—Foleshill Hall Hotel, Lythalls-lane, for Messrs. Phillips & Marriott, Ltd.; twelve houses, Windmill-street, Exhall, for Messrs. J. Magson & Sons; six houses and shop, Bulkington-lane, Bedworth, for Mr. J. D. Johnson; four houses Elmsdale-avenue, Foleshill, for Mr. E. K. Purnell; two houses, Crescent-avenue, Stoke, for Mr. E. K. Purnell; a house, Black Horse-road, Foleshill, for Mr. F. Bricknell; organ chamber, Free Methodist Church, Alderman's Green, for the Trustees.

Great Harwood.—The Liverpool Chancery Court has approved the scheme for providing a building for public lectures and technical classes, &c., at Great Harwood, to be known as the Mercer Hall, out of the legacy to the town under the will of Miss Maria Mercer. The estimated cost of the building was stated to be £14,368.

Gorey.—The deadlock in connection with the Gorey Garden City scheme has been relieved by the promise of the L.G.B. to sanction the building of ten out of the seventy cottages originally decided on, but this is on the stipulation that the Council will go on with the remainder of the cottages when the war is over.

Guildford.—A L.G.B. inquiry has been held into the application of the T.C. for sanction to raise a loan of £10,500 for the erection of forty-two workmen's cottages in Old Farm-road and Woking-road.

Halifax.—The Borough Surveyor has been instructed to prepare plans for making-up Lily-street, Sarah-street, Alexander-street, Cowper-street, Union-street, and Freedom-street.

Hemel Hempstead.—Plan passed for additions to the River Glade Factory, for Messrs. G. B. Kent & Sons.

Hemsworth.—Plans passed by the R.D.C.:—Stable and outbuildings to four houses at Ryhill, for Mr. Geo. Bowles; eight houses at Ryhill, for Mr. Geo. Bowles; drainage, etc., to nine houses at Ackworth, for Mr. J. Lodge's executors; four houses, Kirkby Bridge Field-lane, South Kirkby, for Mr. Nelson Turner; alterations and additions to West End Club, Hemsworth; house for steward of the Empire Working Men's Club, Moorthorpe, for Messrs. Swift Bros.; four houses and shops at South Elmsall, for Messrs. White, Smith, & Co.

Horbury.—Two cottages, for Mr. J. H. Glover; four cottages, for the Horbury Co-operative Society.

London.—The Building Act Committee of the L.C.C. has granted the application of Mr. E. W. Fisher to erect a building on the south-eastern side of Upper Tooting-road; and that of Messrs. Holliday and Stanger to erect two houses on the northern side of Woodbourne-avenue, Streatham. The Improvements Committee have approved the drawings of the buildings proposed to be erected on the sites leased in the following cases:—Kingsway and Aldwych, Kingsway and General Property Trust, Ltd., Mr. Stafford Charles; High-street, Wandsworth, Mr. Bretzfelder, Mr. Cresswell.

Long Sutton.—A L.G.B. inquiry has been held with reference to the application of the U.D.C. to borrow £600 for the purpose of laying out part of the land acquired for a cemetery.

Ludlow.—The R.D.C. have decided to repair Newington Bridge, which is reported to be in a dangerous state.

Luton.—Plans passed for additions to Messrs. Bontwood & Lyon's factory, for three houses for Mr. C. H. White, and a factory in Hartley-road for Mr. T. Gurney.

Maesbury.—The Shropshire E.C. has completed the purchase of a site for a school.

Monmouthshire.—At the annual meeting of the Monmouthshire Insurance Committee it was stated that plans had been placed before the Welsh Commissioners for the erection of a hospital to cost £20,000, on the site given by Mr. J. C. Hanbury, Pontypool.

Newmarket.—The R.D.C. have adopted plans for cottages at Isleham, and they will be submitted to the L.G.B.

Oswestry.—Plans have been submitted to the R.D.C. in connection with the Weston Rhyn Garden Village, and the Sanitary Inspector has been instructed to confer with the architect with reference to questions of drainage. Plans have been passed for a new house in Llys-lane for Mr. John Jones, and for three cottages at Weston Rhyn for Mr. Frith, acting on behalf of Mrs. Barnes.

Penistone.—The Public Works Loan Board have agreed to lend the U.D.C. £880 for water supply.

Penmaenmawr.—Bungalow, Foel-road, for Mrs. Wynne C. Jones; two cottages, for Mrs. Parry.

Pontefract.—Plans passed by the R.D.C.:—House at Park-avenue, Carleton, for Mr. W. Wood; two cottages at Cridling Stubbs, for Sidney Sussex College; four houses at Carleton, for Mr. F. W. Briggs; house at Churchfields, for Mr. Hanson; and for house at Park-avenue, for Mr. J. Townsley.

Reigate.—Plans passed by the R.D.C.:—House, Silverlea-gardens, Horley, Mr. A. H. Brown, Thornton Heath; two cottages, Brighton-road, Horley, Mr. W. Askew, Station-road, Oxted; addition to house, Salfords, Mr. F. Parsons, Brighton; and cottage, Walton Heath, Mr. E. D. Morton, "Heath Croft," Walton-on-the-Hill.

Renfrewshire.—The Buildings Committee of Upper Renfrewshire have approved of the following plans:—Motor garage in Maryville-avenue, Giffnock, for Mr. William Anderson, Newton-Mearns; engine-house at Chain-road, Paisley, for Mr. William Peacock, Cathairn, Elderslie; double cottage at the corner of Overlee-road and Victoria-crescent, Clarkston, for the Glasgow and District Garden City and Cottage Building Company; and four terrace houses in Carrolside-avenue, Clarkston, for Messrs. Andrew Mickel & Co., 4, Bath-street, Glasgow.

Rochester.—Plans passed by the T.C.:—Additions to Strood Vicarage, for the Ecclesiastical Commissioners. Plans for two cottages at Fort Clarence, Borstal-road, for Mr. C. T. Smith, are before the Council.

Rollesby.—Plans passed by the R.D.C.:—Additions to the King's Arms, Martham, for Messrs. Lacon & Company; washhouse, Ormesby Hall.

Sedgefield.—To meet the demand for housing accommodation at Chilton-lane, consequent upon the development of the Mainsforth Colliery of the Carlton Iron Company, Ltd., the company have presented to the R.D.C. plans, which have been passed, for 437 houses. Of these 408 are to be erected behind Chilton-lane and the remainder behind Chapel-row, and it is the intention to proceed with about a hundred immediately, the rest being left over till times are more opportune.

Shepshed.—The L.G.B. have written to the U.D.C. approving generally of the scheme for developing the land Leicester-road and Newwalk and Oakley-road, and for the erection of workmen's dwellings under Part III. of the Act of 1890.

Sherborne.—The U.D.C. have decided to seek sanction from the L.G.B. to borrow £4,000 to complete the sewage scheme.

Slough.—The U.D.C. have passed plans for the drainage of six houses in Wexham-road, for Mr. E. H. Nash.

Southampton.—The L.G.B. have held an inquiry into the application of the T.C. for sanction to borrow the sum of £14,000 for the provision of a water tower in connection with the waterworks undertaking.

Sunderland.—The House of Lords Committee has passed the preamble of the Weardale and Consett Water Bill, which authorises, amongst other things, the construction of a reservoir at a cost of £400,000.

Torrington.—The L.G.B. have informed the R.D.C. that they will sanction a loan for the Sherbear housing scheme when the present emergency has passed.

Wakefield.—House in Balne-lane and one in Cardigan-terrace, for Mr. W. Wrigley; house, Peterson-road, for Mr. W. H. Ogden; house in Pinfold-lane and warehouse, for Messrs. J. R. & F. Lister; four houses, Colton-street, for Mr. H. Dobson.

Wallsend.—The Wallsend and Hebburn Coal Company, Ltd., are engaged in important developments at their collieries, the first objective being a radical improvement in the system of ventilation, which entails sinking a new shaft at the Rising Sun Pit, opening up old shafts at the Edward Pit at Wallsend, and the introduction of many structural alterations above and below ground.

Willington.—The U.D.C. have passed plans for alteration to two houses in Lydia-street, by Mr. J. H. Armory.

Yarmouth.—Plans approved:—Garage, corner house, Park-road, Gorleston, for Mr. G. H. Brown; additions, fishing premises, South Denes-road, for Mr. Henry Sutton.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, HAYWARDS HEATH.

The opening ceremony in connection with this new building, which forms the first section of a larger scheme, took place on the 21st inst. Local sand-faced red bricks and tiles have been used for the walls and roof externally, and Bath stone for the traceried windows and dressings. The seating, pulpit, and platform furniture are of oak. The cost has been about £2,270, including seating and lighting, Mr. T. White, of Haywards Heath, being the contractor. The architects are Messrs. George Baines & Son, Clement's-inn, Strand, W.C.

PREMISES, NEW NORTH-STREET, W.C.

Warehouse premises are in course of erection in New North-street, Theobald's-road, W.C. The architects are Messrs. George & T. S. Vickery, Gresham-street, E.C. The general contractors are Messrs. Ashby & Horner, Ltd., Aldgate, E., and the steelwork is by Messrs. Richard Moreland & Son, Ltd., Goswell-road, E.C.

TRADE NEWS.

In the desire to avoid purchasing any article that has the slightest appearance of German origin or manufacture the public are apt to conclude that, unless the commodity they feel inclined to buy has a thoroughly English name, it must necessarily come from Germany. This prejudice, we are informed, has affected somewhat an article like "Ronuk" floor polish, which is entirely English. When the polish was first invented, the owners offered a prize of £5 to anyone who would submit an appropriate title, and "Ronuk," which is derived from a Persian word meaning beauty, splendour, was adopted.

The Kent and Canterbury Hospital is being supplied with Shorland's warm-air ventilating patent Manchester stoves by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

PATENTS.

APPLICATIONS PUBLISHED.*

23,416 of 1913.—Bossen & Burghardt: Process for the manufacture of imitation marble, semi-precious and rare stones, majolica, and glazed tiles or pottery.

23,481 of 1913.—Herbert John Marsden, trading as Thornhill, Bednal, & Co. (Joshua Duisberg, Germany): Tube and nut wrench or spanner.

23,531 of 1913.—Michael Heimbach: Sockets for wood piles.

23,632 of 1913.—Michael Heimbach: Sockets for wood piles.

24,023 of 1913.—Hermann Jack: Process for the manufacture of plastic and elastic material for tarring roads or other purposes.

7,695 of 1914.—Carl Kleyer: Radiator for stove flues.

8,267 of 1914.—Heinrich Christiansen and Heinrich Bassmann: Embankments such as those employed in the construction of railways.

8,272 of 1914.—Wilhelm Hamann: Clasps, clips, or the like, for suspending curtains, hose, and like articles.

9,938 of 1914.—Albert Chauvin: Machines for splitting or cleaving slate blocks.

12,416 of 1914.—William Clark: Ladders.

14,510 of 1914.—John Whittle: Apparatus for cutting tiles and the like.

14,865 of 1914.—Benjamin Hannen: Manufacture of white cement.

15,226 of 1914.—Seth Burton: Casement windows, doors, and the like.

15,258 of 1914.—George Albert Herdman: Lattice framework of laths or the like, more especially intended for use in the construction of slabs, ceilings, walls, or partitions.

15,332 of 1914.—Henry George Nicholson-Lailey: Pipe-aligning instrument.

15,978 of 1914.—Walter Audaer Wilson: Gas fires.

16,200 of 1914.—Harry Manning Clements: Sliding sash windows.

16,454 of 1914.—Kelita Wainwright Robinson: Locks.

16,560 of 1914.—Archibald Denny and Duncan Geddes Anderson: Process for the production of an improved gypsum cement.

16,615 of 1914.—John Faulder Burn and Fred Wetherell Turner: Machines for moulding concrete or like substances.

18,005 of 1914.—Robert Edmund Golightly: Process for the manufacture of cement, asbestos, tiles, and the like.

18,218 of 1914.—Charles Thomas Lee: Construction of strongrooms, safes, armoured structures, and so forth.

18,618 of 1914.—William Simpkiss: Saws.

21,129 of 1914.—James Kay Horsburgh: Chimney and ventilating shaft tops.

2,074 of 1915.—George William Horton: Staging for use in repairing, rebuilding, and pointing chimneys and like stacks.

5,169 of 1915.—Harold Arnold Woolnough: Bolt sockets.

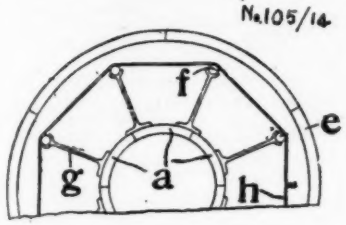
5,262 of 1915.—Samuel Rowland Parkes: Handles for latches.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

SELECTED PATENT.

105 of 1914.—Frederick Thackeray: Columns.

This relates to concrete columns which are formed with an inner shaft of curved slabs *a*, surrounded by plain or reinforced concrete cast between the slabs *a* and cylindrical or polygonal outer temporary centering or permanent slabs *e*. The slabs *a* are bound at intervals with wire, and may be made of plain or reinforced concrete, terra-cotta, earthenware, asphalt, or plaster. The inner shaft may be left hollow for use as a smoke or other flue or for pipes or wires, or it may be filled with plain or reinforced concrete, which may be loaded before the outer portion has set. The main bars *f* may be held in position by means of spacers *g* and wire *h*.



NEW COMPANIES.

THE undermentioned particulars of new companies recently registered are taken from the Daily Register compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, Chancery-lane, W.C.:—

ARTHUR J. KING; LTD. (140,878). Registered July 5. To acquire and carry on the business of builders and decorators now carried on as Arthur J. King, at 60, Southgate-road, Hackney, and to enter into an agreement. Also to carry on business of builders' merchants, brick and tile manufacturers, sanitary, gas, hot-water, and general engineers, etc. Nominal capital, £500 in 500 £1 shares.

WET REPELLER, LTD. (140,923), 20, High Holborn, W.C. Registered July 8. To enter into an agreement and to carry on business of manufacturers and dealers in waterproofing paints, preparation and materials, waterproofs, builders, contractors, decorators, merchants, dealers in paints, stone, sand, lime, bricks, timber, hardware, etc., brick, tile, and terra-cotta makers. Nominal capital, £2,000 in 2,000 £1 shares.

T. W. HEATH, LTD. (140,941), 154, Cromwell-road, S.W. Registered July 10. To carry on the business of builders and contractors in all their branches, office and shop fitters, designers, furnishers, cabinet-makers, furniture removers, carriers, land, estate and house agents, etc. Nominal capital, £550 in 500 £1 Preference shares and 1,000 1s. Ordinary shares.

TOTTERNHOE LIME AND STONE COMPANY, LTD. (140,928), 21, Great St. Helens, E.C. Registered July 9. To enter into an agreement and to carry on business of lime manufacturers, quarry proprietors, coal, coke, lime, brick, tile, and builders' merchants; brick, tile, and cement makers; colliery proprietors, brokers, shipping agents, etc. Nominal capital, £7,500 in 7,500 £1 Ordinary shares.

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to THE BUILDER LTD., and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

RATES OF WAGES IN THE BUILDING TRADE.

THE following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur:—

—	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons' Labourers.	Bricklayers' Labourers.	Plasterers' Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Aberdare	9	—	9½	9½	—	9	8	6½	6½	6½
Accrington	10	9½	9½	9½	9	9	9½	6½	6½	6½
Altrincham	9½	10	10½	10	8½	10	9	6½	6½	6½
Ashton-under-Lyne	10½	10½	10	10½	9	10	9	6	6	7
Barnsley	9½	9½	9½	9½	9	9	8½	7	7	7
Barrow-in-Furness	9½	10	9½	9½	9½	9½	9½	7	7	7
Barry	9½	9½	9½	10	—	9	8½	6½	6½	6½
Bath	8½	8½	8½	8	7½	8	7½	6	6	6
Bedford	8	8	8	8½	8	9	6½	5	5	5½
Birkenhead	11	11	11	11½	11	11	9½	7	7	7
Birmingham	11	11	11	11	10½	11½	9½	8	8	8
Bishop Auckland	9	9	9	9	10	9	7½	6	6	6½
Blackburn	10	10½	10	10	9½	10	9½	6½	7½	7½
Blackpool	10½	9½	9½	9½	8½	9	8½	6	6	6
Bolton	10	10½	10	10½	10	10	9½	6–7	6–7	6–7
Bournemouth	8½	9	9	9	8½	9	8½	6½	6½	6½
Bradford	10	10	9½	9½	9½	10	8½	7	7	7
Bridgwater	6½	6½	6½	6½	6½	6½	6	4	4	4
Brighton	9	8½	8½	8½	—	8	7	6	6	6
Bristol	10½	10½	10½	10½	—	10½	9½	7½	7½	7½
Burnley	10	9½	9½	9½	8	9	9½	7	7	7½
Burton-on-Trent	9	9	9	9½	9	9	8½	6½	6½	6½
Bury	10½	10½	10	9	9½	10	9	6	6	6
Cambridge	9½	9	9	9½	9½	9½	7½	6	6	6
Canterbury	8½	8	8	10	—	8½–9	7	5	5	5
Cardiff	10	10	10	10	10	10	9	7	7	7
Chatham	8	9	9	9	9	9	7½	6	6	6
Chelmsford	8	7½	8½	9	—	7½	6½	5	5	6½
Cheltenham	8½	8½	8½	8½	—	8½	8½	6	6	6
Chester	9½	10	9½	9½	9½	9½	8½	5½	6½–6½	5–5½
Chesterfield	9	9	9	8	9	8½	8½	5½	5½	5½
Colchester	8	8½	8½	9	8	9	6	5½	5½	5½
Coventry	10½	10½	10½	10½	9½	10½	9½	7½	7½	7½
Crewe	7	8	7½	9	8	8	7½	5	5½	6
Darlington	9½	9½	9½	10	10	9	8½	6½	6½	6½
Derby	9½	9½	9	9	9	9	8	6½	6½	7
Doncaster	9½	9½	9	9	9	9	8	6½	6½	7
Dudley	8½	8½	9	8½	8½	8	7½	5½	5½	6
Durham	9	9	9½	9	10	9	8½	6	6	6½
East Glamorgan and Monmouthshire Valleys	9½	9½	9½	9½	—	—	8½	6½	6½	6½
Exeter	8	8½	8	8½	7½	7½	7	5½	5½	5½
Folkestone	8½	8½	8½	9	8½	8½	7–7½	6½	6½	6½
Gloucester	8	8½	8½	8	8	8½	8	5½	5½	5½
Grantham	8	8	7½	7½–8	7½–8	7	6½	5	5	5
Grays	—	10	10	—	—	9½	8½	7	7	7
Grimsby	9	9	9	9½	9	8	8½	7	7	7
Great Yarmouth	8	8	8	—	8	8	6½	5	5	—
Halifax	10	10	9	8½	8½	9	8½	7	7	7
Harrogate	9½	9½	9	9	8	9	8½	6½	6½	6½
Hartlepools	9	10	9½	10	10	10	9	7	7	7½
Hastings	8½	8	8	8½	8	8	7	6½	5½	6½
Hereford	8	8	7½	8½	8	7	7	5½	5½	5½
Huddersfield	10	9½	9½	9½	10	9	8½	7	7	7
Hull	10½	10	10	10	10	10	8½	7½	7½	7½
Ipswich	8½	8½	8½	9	9	8½	7	5½	5½	5½
Lancaster	10	10	9	9	9	9	9	5½	6	6
Leamington Spa	9	9	9	8½	9	9	8	6	6	6
Leeds	10	10	10	10	9	10	8½	7½	7½	7½
Leicester	9½	9½	10	10½	10	9½	9	7	7	7½
Lincoln	9	8½	8½	9	8½	8½	8	6	5½	6½
Liverpool	11	11	11	11	10½	11	9½	7	7	7
Llanelly	9½	9½	9½	8½	9	8½	8	5½	5½	5½
London	11½	11½	11½	11½	—	1s.	9	8	8	8
Loughborough	9	8½	8½	9	9	8½	7½	5½	5½	6½
Luton	9½	8½	8½	8½	9	8½	7½	5½	5½	5½
Maidstone	9	9	9	9	9	9	8	6	6	6
Manchester	10	10½	10½	11	10	10	9½	6½	6½	7½
Mansfield	8½	9	8½	8½	—	8½	8	6	6	—
Merthyr Tydfil	9½	9½	9½	9½	8½	9	8	6½	6½	6½
Middlesbrough	9	10	9½	10	10	10	8½	7	7	7½
Newcastle-on-Tyne	10½	10½	10½	10½	10	10	9	7½	7½	7½
Newport, Mon.	10	10	10	10	8½	10	9	7	7	7
Northampton	9	9	9	9	8½	9	8	6	6	6
Norwich	8½	8½	8½	8½	8	8½	7½	6	6	6
Nottingham	10	10	10	10½	9½	10	9	7½	7½	8
Oldham	10½	10½	10½	10	9	10	9½	7	7	7½
Oxford	9½	9	9	9	8	9	8	6½	6½	6½
Plymouth	9	9	9	9	9	9	8	6½	6½	6½
Pontypridd	9½	9	9	9½	9	9	8	6½	6½	6½
Portsmouth	9½	9½	9½	9½	—	8½	7½	7	7	7
Preston	10½	10½	10	9½	9½	10	9½	5½	6	6½
Reading	8½	9	9	9½	—	9	7½	6	6	6
Rochdale	10½	10½	10	10	8½	9½	9	7	7	7½
Rochester	8	9	9	9	9	8½	7½	6	6	6
Rugby	9½	9½	9½	9½	8	9½	8½	6	6	6
St. Albans	9	9	9	9–10	9	9–10	8	6½	6	6½
St. Helens	9	9½	10	9½	9½	9½	9½	6	6	6
Scarborough	9	9½	9	8½	8	9	8	7	7	7
Sheffield	10½	9½	9½	9½	9½	9½	8½	6½	6½	6½
Shrewsbury	8½	8½	8½	9½	—	8½	7	5½	5½	5½
Southampton	8½	9½	9½	8½	—	9½	8½	6½	6½	6½
Southend-on-Sea	9	9	9	9	P'cework	9	7	6	6	6
Southport	10	10	9½	9½	9½	9½	9½	6½	7	6½
South Shields	10½	10½	10½	10½	10	8½	9	7½	7½	7½
Stockport	10½	10	10	10½	9	10	8½	6	6½–7	7½
Stockton-on-Tees	9	10	9½	10	10	10	9	7	7	7½
Stoke-on-Trent	9	9½	9	9	—	8½	8½	6	6	—
Stroud	7½	7½	7½	7½	7½	7½	7	5	5	5
Sunderland	10	10½	10	10	10	9	9	6½	6½	7
Swansea	9½	9½	9½	9½	8½	9	9	6½	6½	6½
Taunton	7	7	7	7	—	6	6½	4½	4½	4½
Torquay	8	8	8	8	8	8	8	6	6	6
Wakefield	9½	9½	9	9½	8½	9	8	7	7	7
Walsall	9½	9	9	9	8½	9	8	6½	6½	6½
Warrington	8½	9½	9½	10	8½	9½	8½	5½–6	6	6–6½
West Bromwich	10	10	9½	10½	—	9	8	7	7	7
Wigan	10	10½	9½	9½	9	9½	9½		7	7
Windsor	9	9	9	10	—	9	—	6	6	6
Wolverhampton	9½	9½	9½	10	8	10	8	6½	6½	6½
Worcester	8½	9	9	9	9	9	7½	6	6	6
York	9½	9½	9	9½	9½	9	8½	7	7	7

The masons' rate given is for bankers; fixers usually ½d. per hour extra.

List of Competitions, Contracts, etc.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this number: Competitions, — ; Contracts, iv., vi. ; Public Appointments, — ; Auction Sales, xvi. Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements, and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competitions.

JULY 27.—**Ireland.**—The Cleansing Committee of the Dublin Corporation invite designs from landscape designers, etc., resident in Ireland for laying out the reclaimed ground at Fairview, Dublin, and for the conversion of same into a public park. Premiums, £50, £10, and £5. Particulars from the Secretary, Cleansing Committee, Dublin Corporation, Lord Edward-street, Dublin

AUGUST 5.—**Kingstown.**—ARTISANS' DWELLINGS.—The U.D.C. will, on August 5, appoint architects to prepare plans for the Council's new schemes of artisans' dwellings. Particulars of Mr. J. Sherlock Vaughan, Town Clerk, Town Hall, Kingstown.

NO DATE.—**Plymouth.**—DESIGNS FOR BUSINESS PREMISES.—The Committee of the Plymouth Mutual Co-operative and Industrial Society, Ltd., invite architects to submit designs for business premises. Premiums, £75, £50, £25.

Contracts.

BUILDING AND PAINTING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

JULY 26.—**Barnsley.**—OFFICES.—Erection of new offices in Church-street, Barnsley, for the West Riding Permanent Relief Society. Names to Mr. E. W. Dyson, architect, 10, Regent-street, Barnsley.

JULY 26.—**Maesllyn.**—REPAIRS.—(1) Pointing with cement mortar and making watertight, also provide and fix eaves troughs, for Mrs. Lewis, Cottage, Panteg, near Cross Inn; (2) covering the roof of the cowshed belonging to Mrs. Evans, Panteg, for the Cardiganshire C.C. Applications to the County Land Agent, Derw Villa, Cross Inn, S.O., Cardiganshire.

JULY 26.—**Nottingham.**—PAINTING.—Internal cleaning, painting, and papering of their several scattered homes of the B.G. Form of tender of the Foster-Mother of the several scattered homes.

JULY 26.—**Swansea.**—PAINTING.—For cleaning and repainting the bridges of Swansea district lines for the Great Western Railway Company. Specifications of the Engineer at Neath Station.

JULY 26.—**Swindon.**—PAINTING.—For painting, etc., at Electricity Works and Tramways Depot for the Corporation. Specification of Mr. H. Dimmack, Borough Electrical Engineer, Corporation-street, Swindon.

JULY 26.—**Tunbridge Wells.**—REPAIRS.—Summer repairs at the County School for Girls, Tunbridge Wells, for the Kent E.C. Specification of the Local Secretary, Mr. J. Lister, Technical Institute, Tunbridge Wells.

JULY 26.—**Wigan.**—SHELTERS.—Erection of two shelters at the Pemberton Hospital. Specification of the Borough Engineer, Mr. A. T. Gooseman, King-street West, Wigan.

JULY 27.—**Rochester.**—FIRE ENGINE HOUSE.—Conversion of a railway arch at the Common, Rochester, for use as a fire engine house, or, as an alternative, for enclosing the arch with reinforced concrete construction. Drawings at City Surveyor's Office, Guildhall, Rochester.

JULY 27.—**Walsall.**—ALTERATIONS, ETC.—Internal alterations to existing sub-stations, including machine foundations, cable trenches, etc. Specifications of the Borough Electrical Engineer, Wolverhampton-street, Walsall. Deposit, 10s. 6d.

JULY 28.—**Ripponden.**—ALTERATIONS.—Alterations and additions to Chapelfield Mills, Ripponden. Quantities of Messrs. Richard Horsfall & Son, architects, 22A, Commercial-street, Halifax.

JULY 29.—**Athlone.**—DORMITORIES.—Building staff dormitories at Athlone Station for the Midland Great Western Railway of Ireland Company. Quantities of Mr. William Purcell O'Neill, Chief Engineer of the Company, Broadstone Terminus, Dublin. Deposit, £1 1s.

JULY 29.—**Dewsbury.**—SHED.—Erection of a shed at Queen's Mill, Savile Town, Dewsbury (area roughly 6,000 yds. super). Quantities of Messrs. Kirk, Sons, & Ridgway, architects, Market-place, Dewsbury.

JULY 29.—**Wigan.**—PAINTING.—Painting, etc., for the farm bailiff's house, farm buildings, cottages, cattle sheds, etc., at the Sewage Farm, Hoscar. Specification of the Borough Engineer, Mr. A. T. Gooseman, King-street West, Wigan.

JULY 30.—**Sheffield.**—PUMP ROOM.—Erection of pump room, approximately 56 ft. by 37 ft., at the Neepsend Generating Station, for the Corporation Electricity Department. Quantities of Mr. S. E. Fedden, general manager, Commercial-street, Sheffield. Deposit, £2 2s.

AUGUST 2.—**Glasgow.**—ADDITION.—The School Board invite tenders for the various trades required in connection with the construction of an addition to Allan Glen's School. Specification of Mr. J. Clark, Clerk to the Board, School Board Offices, 129, Bath-street, Glasgow.

AUGUST 2.—**Skipton.**—DEMOLITION, ETC.—Pulling down of old buildings in Brook-street and erection of boundary walls, &c., for the U.D.C. Particulars of Mr. Aldridge, Town Hall, Skipton.

AUGUST 2.—**Skipton.**—PAINTING.—For painting of steelwork of Pinder Bridge and Middleton Footbridge, for the U.D.C. Particulars of Mr. Aldridge, Town Hall, Skipton.

* AUGUST 5.—**Southborough.**—REDECORATIONS AND REPAIRS.—The Kent E.C. invite tenders for redectorations and repairs to Southborough Star Rooms Special Subjects Centre.

AUGUST 7.—**Dundee.**—CITY HALL.—The Corporation invite tenders from reinforced concrete contractors for the construction and erection of the columns, beams, floors, etc., forming the reinforced concrete framework of the superstructure of the City Hall. Quantities of the City Architect. Deposit, £5.

AUGUST 13.—**Salisbury.**—EXTENSION OF SORTING OFFICE.—The Commissioners of H.M. Office of Works invite tenders for extension of sorting office.

NO DATE.—**Askern.**—ALTERATIONS, ETC.—Extension and conversion of two houses into shops at Askern. Specification of Mr. Percy Robinson, Hall Gate-chambers, Doncaster.

NO DATE.—**Bargoed.**—BUSINESS PREMISES.—Rebuilding of the Bon Marché, Bargoed, for Messrs. Powell & Jones. Names to Mr. George Kenshole, architect, Station-road, Bargoed. Deposit, £2 2s.

NO DATE.—**Barnsley.**—PAINTING.—Painting four shops and outbuildings at South Kirkby. Mr. C. H. Charlesworth, Market Hill, Barnsley.

NO DATE.—**Halesworth.**—STABLING.—Erection of eight wooden loose boxes and forage house near Halesworth, Suffolk. Particulars of Mr P. Whitaker, Stonchouse, Southwold, Suffolk.

NO DATE.—**High Wycombe.**—LAVATORIES.—Lavatories at Saunderton Workhouse Infirmary, for the Guardians of the Wycombe Union. Particulars of Mr. Thos Thurlow, architect, High Wycombe.

NO DATE.—**Pemberton.**—PAINTING.—Painting Pemberton Colliery Boys' and Girls' School. Particulars of the Rev. J. Woods, Highfield Vicarage, Pemberton.

NO DATE.—**Rosyth.**—HOUSES.—Erection of 150 houses at the Rosyth Naval Base (minimum of twenty-five houses). Names to the Scottish National Housing Company, Ltd., 111, George-street, Edinburgh.

NO DATE.—**Southsea.**—BUSINESS PREMISES.—Pulling down No. 8, King's-road, Southsea, and erecting on the site thereof business premises for Mr. Ellis Goldman. Quantities of Mr. Chas. W. Bevis, F.R.I.B.A., Elm Grove Chambers, Yarborough-road, Southsea. Deposit £1 1s.

NO DATE.—**Torquay.**—DISPENSARY.—Erection of a new dispensary and alterations at Larchmont, Torquay. Specifications of Messrs. E. H. Harbottle & Sons, architects, County Chambers, Exeter.

FURNITURE, MATERIALS, etc.

JULY 26.—**Cannock.**—FURNITURE.—Supply to the Cannock E.C. of 186 dual desks, various sizes, with ink wells and sliding covers complete. Mr. William E. Swift, Secretary, Council Offices, Cannock.

JULY 26.—**Dover.**—ROAD MATERIALS.—Supply to the Corporation of 1000 tons of broken Guernsey granite, 250 tons of ½-in. Guernsey chippings, and 300 tons of mixed granite siftings. Forms of tender of the Town Clerk.

JULY 26.—**Hipperholme.**—MATERIALS.—Supply to the U.D.C. of broken granite, chippings, tarred road material, brooms, cast-iron mains, gaskin, cement, earthenware pipes, kerbs, setts, and flags. Forms of tender, etc., from Mr. G. Wharton Thompson, Engineer, 4, Harrison-road, Halifax.

JULY 28.—**Hull.**—TIMBER.—Supply to the Corporation of about 100 standards hard-grained red deal, 3 by 9, 3 by 8, or 3 by 7, suitable for paving blocks. Forms of tender of Mr. F. W. Bricknell, City Engineer, Guildhall, Hull.

ENGINEERING, IRON, AND STEEL.

JULY 26.—**Dublin.**—ELECTRICAL PLANT.—Supply to the Dublin Corporation of (1) high and low pressure cable and accessories, (2) transformers, (3) transformer pillars, (4) meters. Specifications from the City Electrical Engineer, Fleet-street, Dblin. Deposit, £1 each.

JULY 26.—**Salford.**—PIPING.—Supply of steel steam piping and separator and cast-iron water piping. Particulars from the Borough Electrical Engineer, Frederick-road, Salford.

JULY 28.—**India.**—RAILS.—Supply to the East Indian Railway Company of steel rails. Specification of Mr. C. W. Young, Secretary, Nicholas-lane, London, E.C. Charge, £1 1s.

AUGUST 6.—**Middlesbrough.**—JETTY.—Construction for the River Tees Port Sanitary Authority of a timber jetty, the preparation of a berth with surrounding banks, also the removal from present site and packing up on prepared berth of their floating hospital. Specification of Mr. Ivan C. Barling, Royal Exchange, Middlesbrough. Deposit, £2 2s.

SEPTEMBER 1.—**Adelaide.**—TELEGRAPH INSTRUMENTS.—Supply to the Deputy Postmaster General of condensers, insulation resistance testing sets, relays, rheostats, Morse sounders, and Wheatstone transmitters. Copy of specification at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, E.C.

ROAD, SANITARY, AND WATER WORKS.

JULY 26.—**Hamilton.**—SANITARY FITTINGS.—For the supply of (1) sanitary fittings, (2) laundry and washing house plant, in connection with the Hairmyres Colony, for the District Committee of the Middle Ward of the County of Lanark. Particulars of the architects, Messrs. S. Mitchell & Wilson, 13, Young-street, Edinburgh.

JULY 26.—**Letchworth.**—ROADS.—Construction of about 275 yds. of metalled roads at Letchworth for the Hitchin Rural District Council. Quantities at the Council Offices, 5, Bancroft, Hitchin.

JULY 26.—**Pudsey.**—CLEANING DAM.—For cleaning out the mill dam connected with the New Street Mills at Pudsey, belonging to the Pudsey Worsted Mill Company, Ltd. Specifications of Mr. Wm. Shackleton, architect and surveyor, Manor House-street, Pudsey.

JULY 26.—**Rowley Regis.**—SEWERS.—Relaying and reconstructing sewers in parts of Wright's-lane, Lion-road, and Orchard-street, and also raising highway, etc., at Wright's-lane, for the U.D.C. Specification at the Council House, Old Hill, Staffordshire.

JULY 27.—**Glasgow.**—ROADS.—Forming roads, laying drains, etc., within Ruchill Hospital, for the Corporation. Specifications at the Office of Public Works, 64, Cochrane-street.

JULY 27.—**Melton Mowbray.**—SEWERS.—Construction of 9 and 6-in. sewers, etc., in Long Clawson, for the Melton Mowbray R.D.C. Quantities of Mr. G. E. Fryer, Surveyor, Thorpe-road, Melton Mowbray.

JULY 27.—**Soyland.**—STREET WORKS.—Taking up and relaying about 800 super. yds. of setts in Buck-lane for the Soyland U.D.C. Particulars of Mr. W. Whitehead, Surveyor, Council Offices, Ripponden.

JULY 28.—**Cannock.**—SEWER.—For providing and laying 56 yds. of 9-in. cast-iron pipe and 272 yds. of 9-in. stoneware pipe, etc., at Hennesford, for the Cannock U.D.C. Quantities of Mr. R. Blanchard, Surveyor, Council Offices, Cannock. Deposit £2.

JULY 30.—**Sheffield.**—CONDUIT, ETC.—Water surface conduit, screen chamber, penstocks, valves, etc., for Electrical Department of the Sheffield Corporation. Quantities of Mr. S. E. Fedden, General Manager and Engineer, Commercial-street, Sheffield. Deposit, £2 2s.

Auction Sales.

* JULY 27.—**Bethnal Green.**—Messrs. Fryett, White, & Co. will sell by auction, on the premises, a quantity of builders' merchandise.

* JULY 28.—Messrs. Churchill & Sim will sell by auction, at the Great Hall, Winchester House, Old Broad-street, E.C., an assortment of deals, battens, boards, timbers, etc.

* JULY 29.—**Stockwell-road, S.W.**—Mr. H. W. Smith will sell by auction at yard and works, 36, Stockwell-road, S.W., the stock-in-trade, plant, and rolling stock of a builder and decorator and valuable wood-working machinery

[Those with an asterisk (*) are advertised in this issue.]

PRICES CURRENT OF MATERIALS.

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.]

Since our last issue the prices of tin and solder have been slightly reduced.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River Thames.	£	s.	d.
Best Stocks	2	0	0
Picked Stocks for Facings	2	15	0

Per 1000, Delivered at Railway Depôt, London.

	£	s.	d.		£	s.	d.
Flettons	1	16	0	Best Blue Pressed Staffordshire	3	15	0
Best Fareham Red	3	12	0	Do. Bullnose	4	0	0
Best Red Pressed Ruabon Facing	5	0	0	Best Stourbridge Fire Bricks	4	0	0
GLAZED BRICKS—							
Best White, Ivory, and Salt Glazed Stretchers	13	0	0	D'ble Str'tch'rs	18	10	0
				Double Headers	15	10	0
Headers	12	10	0	One Side and two Ends	19	10	0
Quoins, Bullnose and 4½ in. Flats	16	10	0	Two Sides and one End	20	10	0
				Splays and Squints	18	0	0

Second Quality £1 10s. per 1000 less than best.

	s.	d.	
Thames and Pit Sand	7	9	per yard, delivered.
Thames Ballast	6	6	,, ,,
Best Portland Cement	44	0	per ton, ,,
Best Ground Blue Lias Lime	21	0	,, ,,

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 15s. 6d. per yard delivered.
Stourbridge Fireclay in sacks 35s. 0d. per ton at rly. dpt.

STONE.

Per Ft. Cube.

	s.	d.
BATH STONE—delivered on road waggons, Paddington Depôt	1	7½
Do. do. delivered on road waggons, Nine Elms Depôt	1	9½
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	6
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	8

Per Ft. Cube, delivered at Railway Depôt.

	s.	d.		s.	d.
Ancaster in blocks	1	11	Closeburn Red		
Beer in blocks	1	7	Freestone	2	2
Greenshill in blocks	2	0	Red Mansfield Freestone	2	6
Darley Dale in blocks	2	6	Talacre & Gwespyr Stone	2	6
Red Corsehill in blocks	2	6			

YORK STONE—*Robin Hood Quality.*

Per Ft. Cube, Delivered at Railway Depôt.	s.	d.
Scappled random blocks	2	10

Per Ft. Super., Delivered at Railway Depôt.

	s.	d.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto, ditto	2	6
3 in. sawn two sides slabs (random sizes)	0	11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7
1½ in. to 2 in. ditto, ditto	0	6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	3	0

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landing to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto	3	0
2 in. sawn two sides slabs (random sizes)	1	2
8 in. self-faced random flags	0	5

TILES.

	Per 1000 f.o.r. London. £	s.	d.
Best machine-made tiles or hand-made sand-faced tiles from either Broseley or Staffordshire district	2	12	6
Ornamental ditto	2	15	0
Hip and valley tiles (per dozen)	0	5	6

SLATES.

	Per 1000 of 1200 f.o.r. London. £	s.	d.
Best Blue Bangor slates, 20 by 10	11	5	0
First quality ,, ,,	11	0	0
,, ,, 16 by 8	5	10	0
Best Blue Portmadoc, 20 by 10	11	2	6
First quality ,, ,,	10	12	6
,, ,, 16 by 8	5	10	0

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.		£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	21	10	0	..	22	0	0
Deals: best 3 in. by 9 in.	21	0	0	..	22	0	0
2 in. by 11 in.	23	0	0	..	23	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	19	10	0	..	20	10	0
Battens: best 2½ in. by 6 in. and 3 in. by 6 in.	0	10	0		less than 7 in. and 8 in.		
2 in. by 7 in.	20	0	0	..	—		
3 in. by 4 in.	21	0	0	..	—		
2 in. by 4½ in.	22	10	0	..	—		
3 in. by 4½ in.	21	10	0	..	—		

WOOD (*Continued*).

BUILDING WOOD (*Continued*)—	At per standard. £	s.	d.		£	s.	d.
Deals: seconds	1	0	0	less than best			
Battens: seconds	0	10	0	,, ,,			
2 in. by 4 in. and 2 in. by 6 in.	18	10	0	..	19	10	0
2 in. by 4½ in. and 2 in. by 5 in.	16	10	0	..	17	0	0
Foreign Sawn Boards—							
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.			
¾ in.	1	0	0	,,			
Fir timber: best middling	At per load of 50 ft.						
Memel (average specification)	6	15	0	..	7	15	0
Seconds	6	0	0	..	6	10	0
Small timber (8 in. to 10 in.)	5	5	0	..	5	10	0
Small timber (6 in. to 8 in.)	4	10	0	..	5	0	6
Swedish balks	4	0	0	..	4	10	0
Pitch-pine timber (30 ft. average)	8	5	0	..	9	0	0
JOINERS' WOOD.	At per standard.						
White Sea: first yellow deals, 3 in. by 11 in.	33	15	0	..	35	0	0
Battens, 2½ in. and 3 in. by 7 in.	23	7	6	..	24	7	6
Second yellow deals, 3 in. by 11 in.	27	5	0	..	28	5	0
Do. 3 in. by 9 in.	25	5	0	..	26	5	0
Battens, 2½ in. and 3 in. by 7 in.	20	0	0	..	21	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	20	2	6	..	21	2	6
Battens, 2½ in. and 3 in. by 7 in.	19	0	0	..	20	0	0
Petrograd: first yellow deals, 3 in. by 11 in.	29	10	0	..	31	0	0
Do. 3 in. by 9 in.	25	5	0	..	26	5	0
Battens	19	5	0	..	20	5	0
Second yellow deals, 3 in. by 11 in.	21	10	0	..	23	0	0
Do. 3 in. by 9 in.	20	15	0	..	21	10	0
Battens	19	10	0	..	20	0	0
Third yellow deals, 3 in. by 11 in. / Do. 3 in. by 9 in.	19	10	0	..	—		
Battens	19	0	0	..	19	10	0
White Sea and Petrograd—							
First white deals, 3 in. by 11 in.	22	10	0	..	24	0	0
First white deals, 3 in. by 9 in.	21	0	0	..	22	10	0
Battens	18	10	0	..	19	0	0
Second white deals, 3 in. by 11 in.	20	0	0	..	21	0	0
Second white deals, 3 in. by 9 in.	19	0	0	..	20	0	0
Battens	18	0	0	..	18	10	0
Pitch-pine: deals	34	0	0	..	35	0	0
Under 2 in. thick extra	0	10	0	..	1	0	0
Columbian or Oregon Pine, best quality	28	0	0	..	29	0	0
Yellow Pine—First, regular sizes	57	0	0	upwards.			
Oddments	39	0	0	,,			
Seconds, regular sizes	43	10	0	,,			
Oddments	37	0	0	,,			
Kauri Pine—Planks per ft. cube	0	7	6	..	—		
Oak Logs—							
Large, per ft. cube	0	5	6	..	0	6	6
Small ,, ,,	0	4	6	..	0	5	5
Wainscot Oak Logs, per ft. cub	0	10	6	..	0	12	6
Dry Wainscot Oak, per ft. super. as inch	0	1	0	..	0	1	3
¾ in. do. do.	0	0	10	..	0	1	0
Dry Mahogany—Honduras, Tabasco, per ft. super, as inch	0	1	0	..	0	1	4
Selected, Figury, per ft. super. as inch	0	1	6	..	0	2	6
Cuba Mahogany	0	1	6	..	0	2	6
Dry Walnut, American, per ft. super. as inch	0	1	0	upwards. ..	0	1	3
French, "Italian," Walnut	0	1	0	..	0	1	6
Teak, per load (Rangoon or Moulmein)	28	0	0	..	34	0	0
Do., do. (Java)	24	0	0	..	27	0	0
American Whitewood planks, per ft. cube	0	6	6	..	0	7	6
Prepared Flooring, etc.—	Per square.						
1 in. by 7 in. yellow, planed and shot	0	18	0	..	1	0	0
1 in. by 7 in. yellow, planed and matched	0	18	0	..	1	0	0
1¼ in. by 7 in. yellow, planed and matched	1	2	0	..	1	5	0
1 in. by 7 in. white, planed and shot	0	17	6	..	1	0	0
1 in. by 7 in. white, planed and matched	0	18	0	..	1	0	0
1¼ in. by 7 in. white, planed and matched	1	2	0	..	1	5	0
¾ in. by 7 in. yellow, matched and beaded or V-jointed boards	0	14	6	..	0	16	6
1 in. by 7 in. ,, ,,	0	18	6	..	1	1	0
¾ in. by 7 in. white ,, ,,	0	14	6	..	0	16	6
1 in. by 7 in. ,, ,,	0	18	6	..	1	1	0

6 in. at 6d. to 9d. per square less than 7 in.

METALS.

JOISTS, GIRDERS, &c.

	In London or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	12	10	0	..	13	0	0
Compound Girders, ordinary sections	15	10	0	..	16	0	0
Steel Compound Stanchions	16	0	0	..	17	0	0
Angles, Tees, and Channels, ordinary sections	14	10	0	..	15	0	0
Flitch Plates	14	10	0	..	15	0	0
Cast Iron Columns & Stanchions, including ordinary patterns	11	10	0	..	12	0	0
IRON—	Per ton, in London.						
Common Bars	12	10	0	..	—		
Staffordshire Crown Bars, good merchant quality	13	0	0	..	13	10	0
Staffordshire "Marked Bars"	13	10	0	..	14	0	0

METALS (*Continued*).

IRON (*Continued*)—	Per ton, in London. £	s.	d.		£	s.	d.
Mild Steel Bars	13	0	0	..	14	0	0
Steel Bars, Ferro-Concrete quality, £14 basis price.							
Hoop Iron, basis price	14	0	0	..	—		
,, ,, Galvanised	26	10	0	..	—		
(* And upwards, according to size and gauge.)							
Sheet Iron Black—							
Ordinary sizes to 20 g.	13	10	0	..	—		
,, ,, 24 g.	14	10	0	..	—		
,, ,, 26 g.	16	0	0	..	—		
Sheet Iron, Galvanised, flat, ordinary quality—							
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	24	0	0	..	—		
Ordinary sizes to 22 g. and 24 g.	25	0	0	..	—		
Ordinary sizes to 26 g.	26	0	0	..	—		
Sheet Iron, Galvanised, flat, best quality—							
Ordinary sizes to 20 g.	26	0	0	..	—		
,, ,, 22 g. and 24 g.	26	10	0	..	—		
Ordinary sizes to 26 g.	27	0	0	..	—		
Galvanised Corrugated Sheets—							
Ordinary sizes, 6 ft. to 8 ft. 20 g.	24	0	0	..	—		
Ordinary sizes, 22 g. and 24 g.	24	10	0	..	—		
Ordinary sizes, 26 g.	25	0	0	..	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	16	0	0	..	—		
Best Soft Steel Sheets, 22 g. & 24 g.	16	10	0	..	—		
Best Soft Steel Sheets, 26 g.	18	0	0	..	—		
Cut Nails, 3 in. to 6 in.	15	0	0	..	15	10	0
(Under 3 in., usual trade extras.)							

LEAD, &c.

Delivered in London.

	£	s.	d.		
LEAD—Sheet, English, 4 lb. and up	32	0	0	..	—
Pipe in coils	32	10	0	..	—
Soil pipe	35	10	0	..	—
Compo pipe	35	10	0	..	—
NOTE—Delivery in country in not less than 5 cwt. lots 1s. per cwt. extra.					
COPPER—					
Strong Sheet ..... per lb.	0	1	5	..	—
Thin ,, ... ,,	0	1	6	..	—
Copper nails ..... ,,	0	1	5	..	—
Copper wire ..... ,,	0	1	5	..	—
BRASS—					
Strong Sheet ..... ,,	0	1	3	..	—
Thin ..... ,,	0	1	4	..	—
TIN—English Ingots ,,	0	1	9	..	—
SOLDER—Plumbers' ,,	0	0	10	..	—
Tinmen's ,,	0	1	1	..	—
Blowpipe ,,	0	1	3	..	—

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

Per Ft. Delivered.

15 oz. thirds	4½d.	26 oz. fourths	5½d.
,, fourths	4½d.	32 oz. thirds	8½d.
21 oz. thirds	5½d.	,, fourths	7d.
,, fourths	5d.	Fluted Sheet, 15 oz.	5½d.
26 oz. thirds	6½d.	,, 21 oz.	6½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

Per Ft.

⅛ Rolled plate	3d.
⅛ Rough rolled and rough cast plate	3½d.
¼ Rough rolled and rough cast plate	4d.
Figured Rolled, Oxford Rolled, Oceanic, Arctic Muffled, and Rolled Cathedral, white	4½d.
Ditto, tinted	6d.
Rolled Sheet	3½d

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	5
,, ,, ,, in barrels	,,	0	2	6
,, ,, ,, in drums	,,	0	2	9
Boiled ,, ,, in barrels	,,	0	2	8
,, ,, ,, in drums	,,	0	3	0
Turpentine in barrels	,,	0	3	2
,, in drums	,,	0	3	5
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)		37	10	0
Red Lead, Dry	per ton	37	0	0
Best Linseed Oil Putty	per cwt.	0	10	0
Stockholm Tar	per barrel	1	12	0
GENUINE WHITE LEAD PAINT—				
Blackfriars, Nine Elms, or Park, etc., brands (in 14 lb. tins), not less than 5 cwt. lots	per cwt. delivered	2	6	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	6
Fine Elastic Carriage	0	12	9
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	10	0
Finest Pale Durable Copal	0	18	6
Extra Pale French Oil	1	1	0
Eggshell Flating Varnish	0	18	0
White Plate Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	0
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	0
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	6

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.]

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 2 p.m. on Wednesday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated.

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALDERSHOT.—For erection of an additional brick-built fever block at the Isolation Hospital, North Town, Aldershot, for the Urban District Council. Mr. F. C. Uren, Surveyor, Municipal-buildings, Aldershot :—

Wells Bros.	£1,174			Sherfield Bros., Farnham*	£717		
G. Kemp & Co.	769						
Cæsar Bros.	735						

ALDWICK-LE-STREET.—For works of surface drainage, for the Aldwick-le-Street Urban District Council. Mr. Geo. Gledhill, Surveyor, Aldwick-le-Street :—

A. Storey	£321	0	0	H. Drake & Co.	£229	2	0
D. Gill & Sons	260	0	0	E. F. Searle	220	4	9
E. S. Knight	239	5	6	F. Haslam	214	8	7
C. Fletcher	237	12	3				
G. W. Muschamp	232	0	0				

ALFORD.—Erection of new Drumallochie Bridge, for the Alford District Committee :—
Tawse, Aberdeen* £1,540 8 3

BARNSLEY.—Painting of Lambert Block at Kendray Hospital, for the Barnsley Corporation :—
J. Snowden & Son* £119 10

CAERPHILLY.—For painting twenty houses, for the Pontygwindy Building Club, Caerphilly :—

Jenkins & Co.	£52	10	0	W. Edwards, Panter, Llanbradach*	£35	0	0
C. Laumier & Co.	47	0	0	Jones Bros.	33	10	0
W. J. Harries	38	17	6	J. Wills	32	0	0
H. R. Cypher	35	0	0	A. Buckley	23	10	0

CARDIFF.—For painting and colouring several schools, for the Cardiff Education Committee :—
St. Peter's R.C.: Gough Bros., Partridge-road, Cardiff* £96 0 0
St. Mary's R.C.: James & Beddoe, Dogfield-street, Cardiff* 51 16 0
Canton National: W. Rowles, Romilly-crescent, Cardiff* 84 0 0
[A separate tender was accepted for each school.]

HOUNSLOW.—For painting and repairs at certain schools, for the Heston and Isleworth Urban District Education Committee. Mr. J. G. Carey, Surveyor, Council House, Hounslow :—
Hounslow Heath Schools.—Repairs, etc.
W. R. Gray, Heston* £70 8 10
Hounslow Town Schools.—Repairs etc.
W. R. Gray, Heston* 40 8 10
Worple-road Schools.—Repairs, etc.
M. J. Tehan, Isleworth* 35 0 0
Heston Schools.—New Partition.
Educational Supply Association, Ltd.* 32 17 6

KIRKCALDY.—For painter work required at the diphtheria, enteric, and observation block, discharge block, and laundry at fever hospital :—
D. B. Stenhouse* £39 19 9

LICHFIELD.—Additions to the small-pox hospital, for the Joint Hospital Committee :—
A. Walmesley* £234

LONDON.—For painting work at twenty-six cottages at Norbury, for the London County Council :—

W. Young	£357	A. H. Inns, Bishopsgate*	£147
C. A. Sedgwick	280		
F. J. Meech	188		

LONDON.—For installing heating apparatus at the Princess-road School (St. Pancras, N.W.), for the London County Council :—

Cannon & Hefford	£1,083	0
Brightside Foundry and Engineering Co., Ltd.	1,055	0
W. Freer	1,040	0
J. Biggs	1,019	0
Yetton & Brockett, Ltd.	1,017	10
W. G. Cannon & Sons, Ltd.	975	0
Palowkar & Sons	953	0
W. Truswell & Son, Sheffield*	938	0

SAWLEY.—For painting the iron bridge over the River Trent at Old Sawley, for the Derbyshire County Council. Mr. J. W. Horton, County Surveyor, County Offices, Derby :—

J. Higginson & Co.	£250	0
R. Skevington & Sons	124	10
Emery & Co., Aston*	112	0

SOUTHAMPTON.—For alterations and additions to business premises, 17, Bridge-street, for the owners and lessees. Mr. William Burrough Hill, F.S.I., architect, Southampton :—

A. Wright & Son	£249	0	0	H. Cawte	£242	16	0
				W. A. Fussell†	233	9	4

WALTHAMSTOW.—For exterior painting to various schools, for the Education Committee. Mr. H. Prosser, M.S.A., Architect and Surveyor to the Committee :—

Queen's-road Schools.

J. Sands	£199	0	0	A. J. Wick	£138	0	0
D. W. Lucas	188	0	0	J. S. Fenn	118	18	6
A. H. Inns	154	0	0	J. J. Woollaston	118	0	0
A. G. Barton	148	0	0				
F. E. McBride, Walthamstow*	142	8	6				

Blackhorse-road Schools.

D. W. Lucas	£194	0		F. E. McBride	£137	15	
A. G. Barton	165	0		A. J. Wick, Walthamstow*	131	0	
A. H. Inns	163	0		J. S. Fenn	128	19	
A. Tranter	143	8					
J. J. Woollaston	139	0					

Edinburgh-road School.

D. W. Lucas	£55	10	0	A. J. Wick, Walthamstow*	£38	10	0
F. E. McBride	49	4	6	J. J. Woollaston	36	0	0
J. S. Fenn	46	18	0				
A. H. Inns	45	17	6				
J. Sands	41	10	0				
A. G. Barton	39	0	0				

STOCKPORT.—For painting and decorating at the fire-stations and firemen's cottages, Chestergate, for the Watch Committee. Mr. J. Atkinson, Borough Surveyor, Town Hall, Stockport :—
Mottershead & Ormesher, 17, Wellington-rd South, Stockport* £55

TOTNES.—For laying of 3-in. cast-iron water main, with valves, etc., at Bitterford, near Ivybridge, for the Totnes Rural District Council. Mr. Wilfrid J. Goode, surveyor, Buckfastleigh :—
Steer & Pearce, Plymouth* £311 3

WORKS FOR H.M. OFFICE OF WORKS.—The following contracts have been placed by H.M. Office of Works during June :—
Building Works.—Birmingham Telegraph Stores, new shed, superstructure, J. Elwell, Ltd., Phœnix Ironworks, Birmingham; Chelsea Hospital, temporary building, F. Pitcher, Ltd., 133, Marylebone-road, N.W.; Liverpool New Parcel Office foundations, etc., H. Kelly & Bro., 130, Rice-lane, Walton, Liverpool.

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PHOTO: DONALD SCOTT, EDINBURGH.

HAGGERSTON CASTLE, NORTHUMBERLAND: MAIN ENTRANCE—RESTORATION OF NORMAN SHAW'S WORK.
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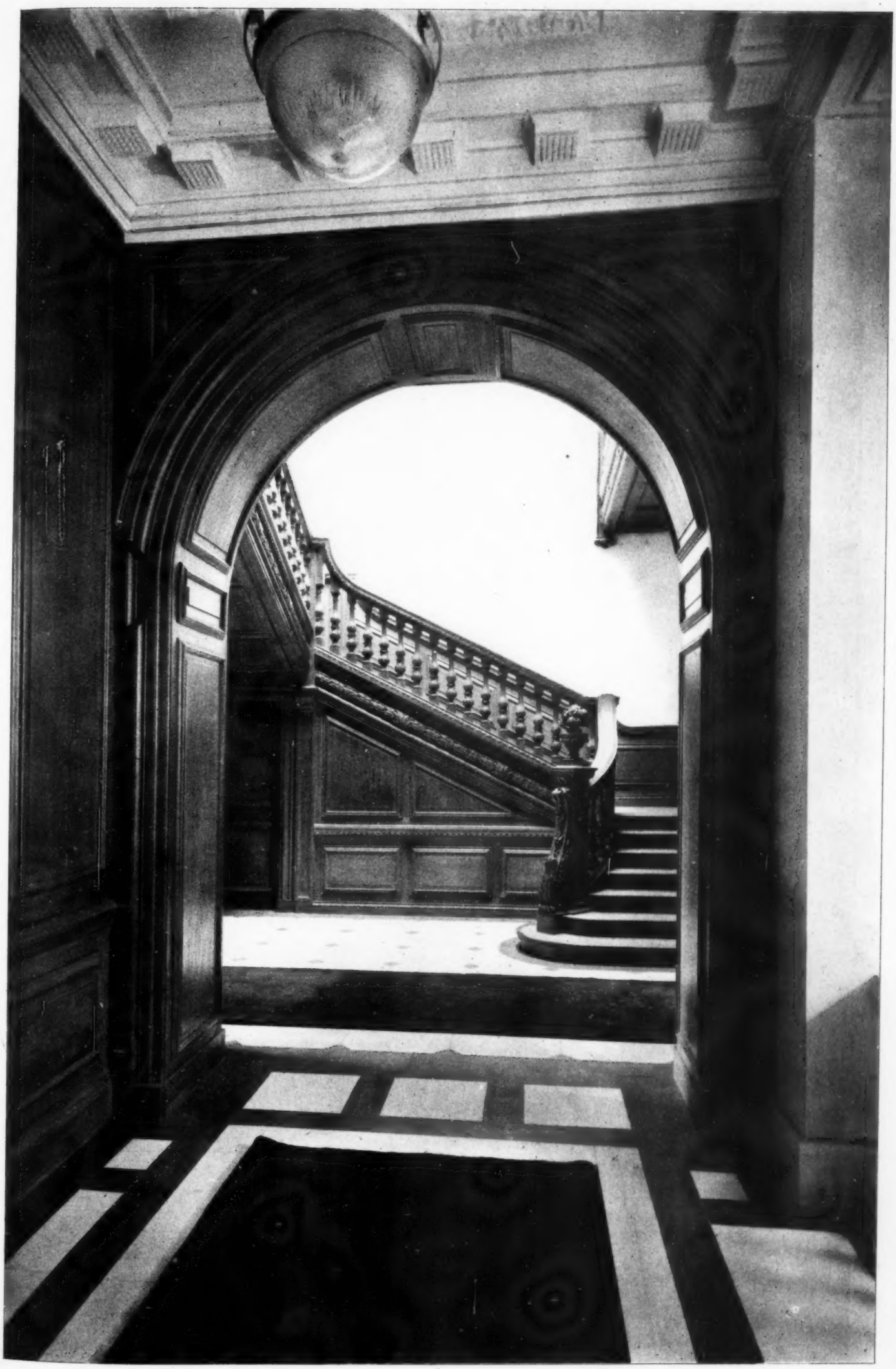
PHOTO: DONALD SCOTT, EDINBURGH.



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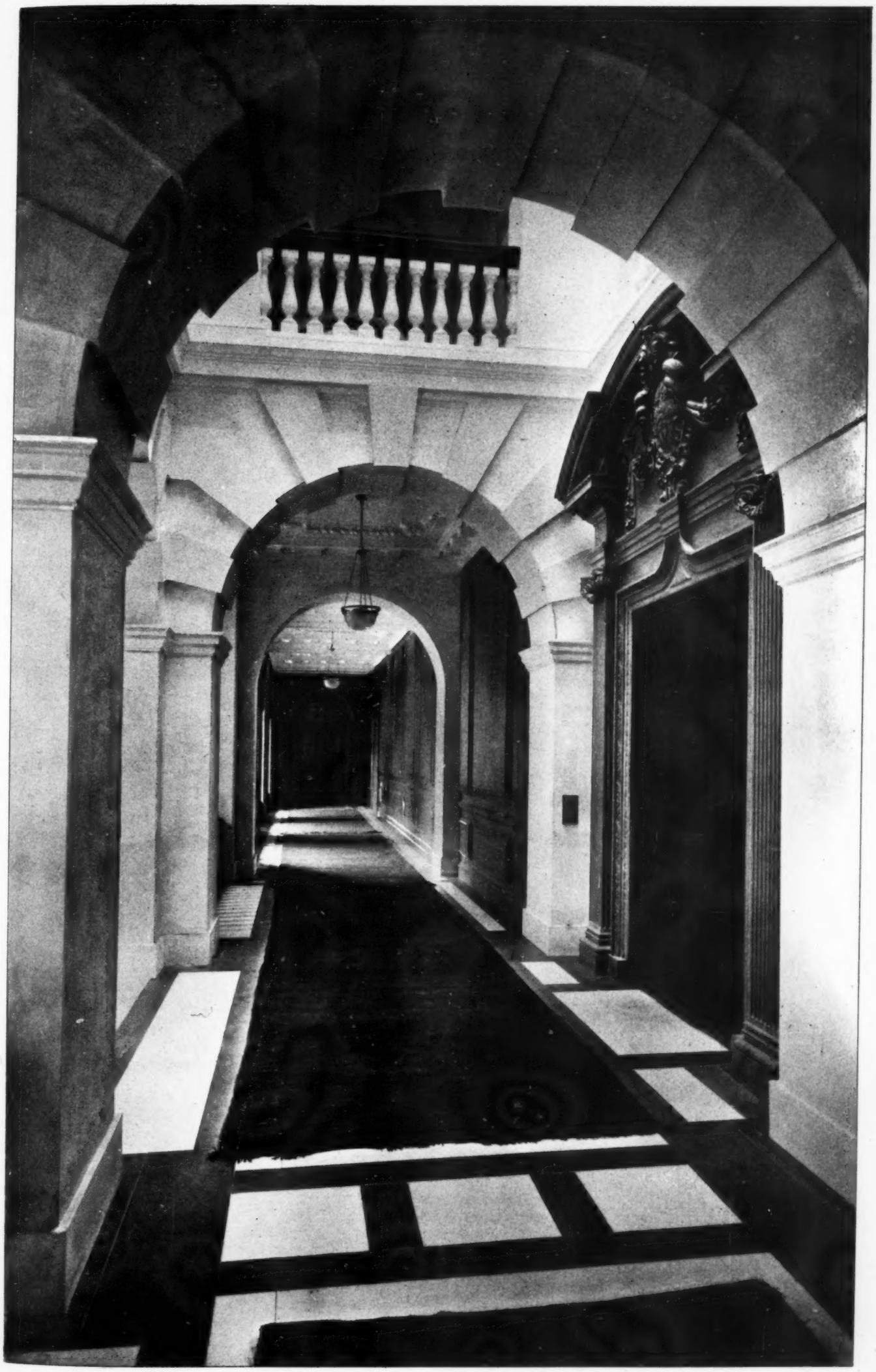

HAGGERSTON CASTLE, NORTHUMBERLAND: CORRIDOR NEXT DRAWING ROOM.

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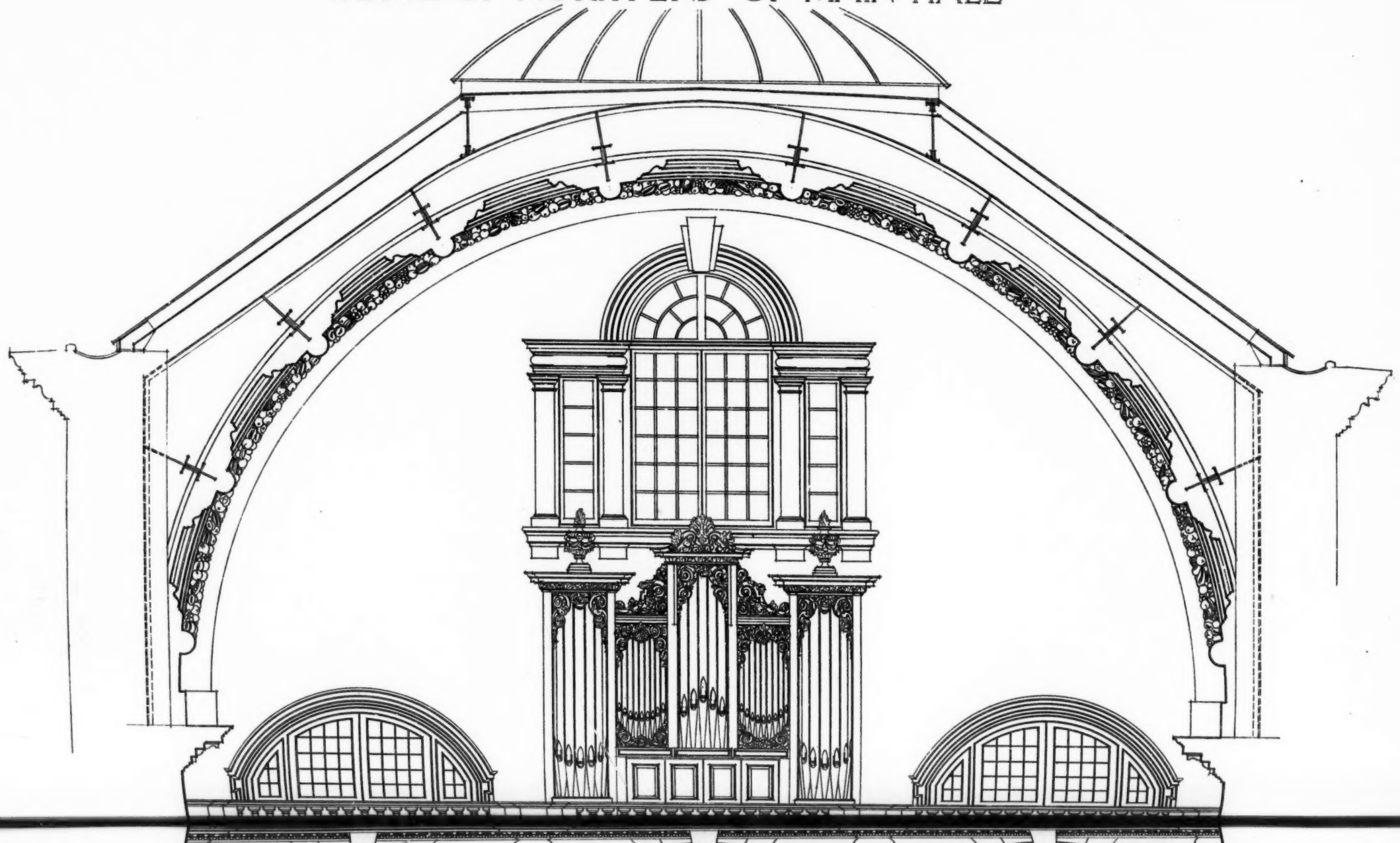
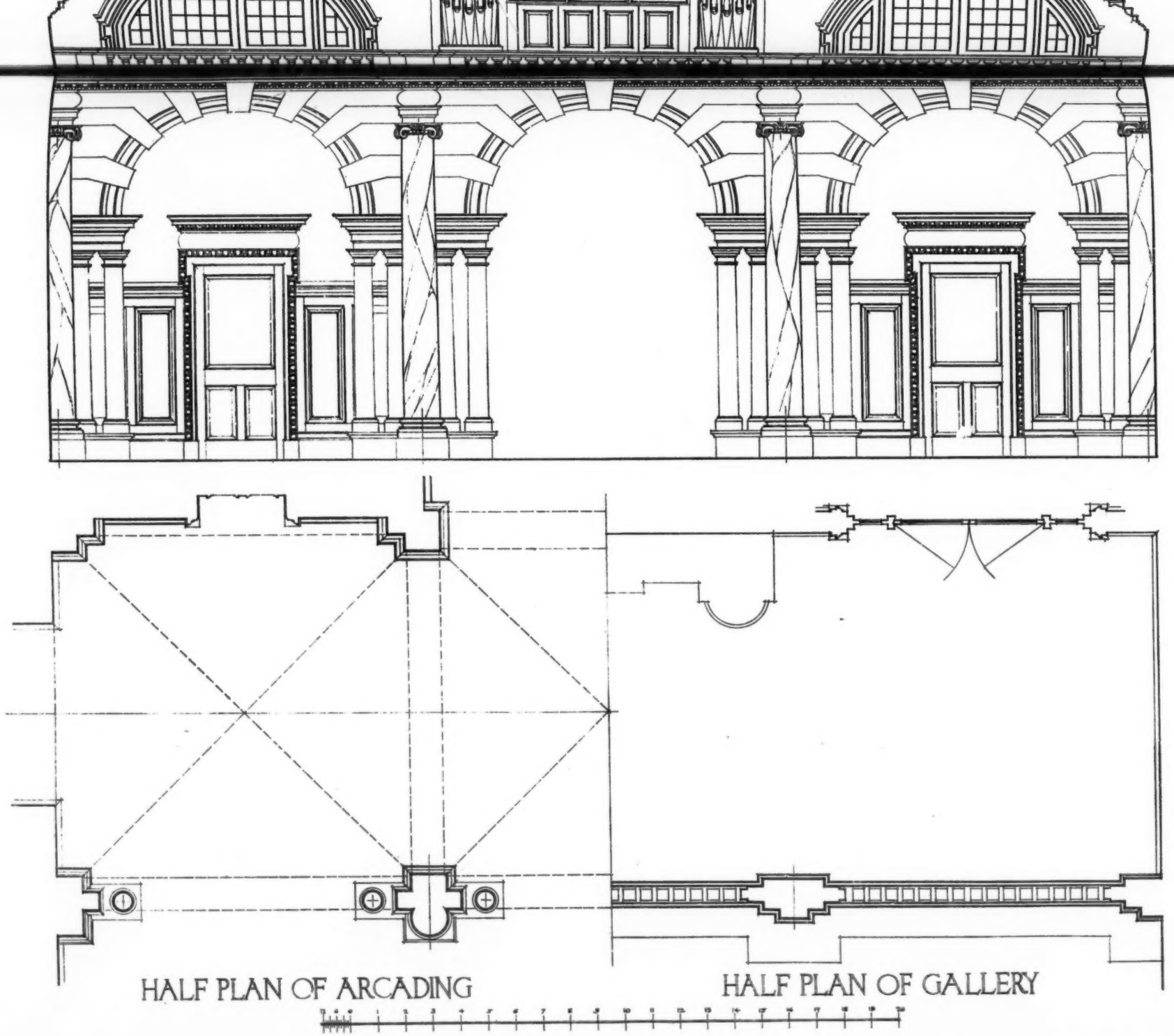
HAGGERSTON CASTLE NORTHVMBERLAND

DETAIL OF NORTH END OF MAIN HALL





HALF PLAN OF ARCADING

HALF PLAN OF GALLERY

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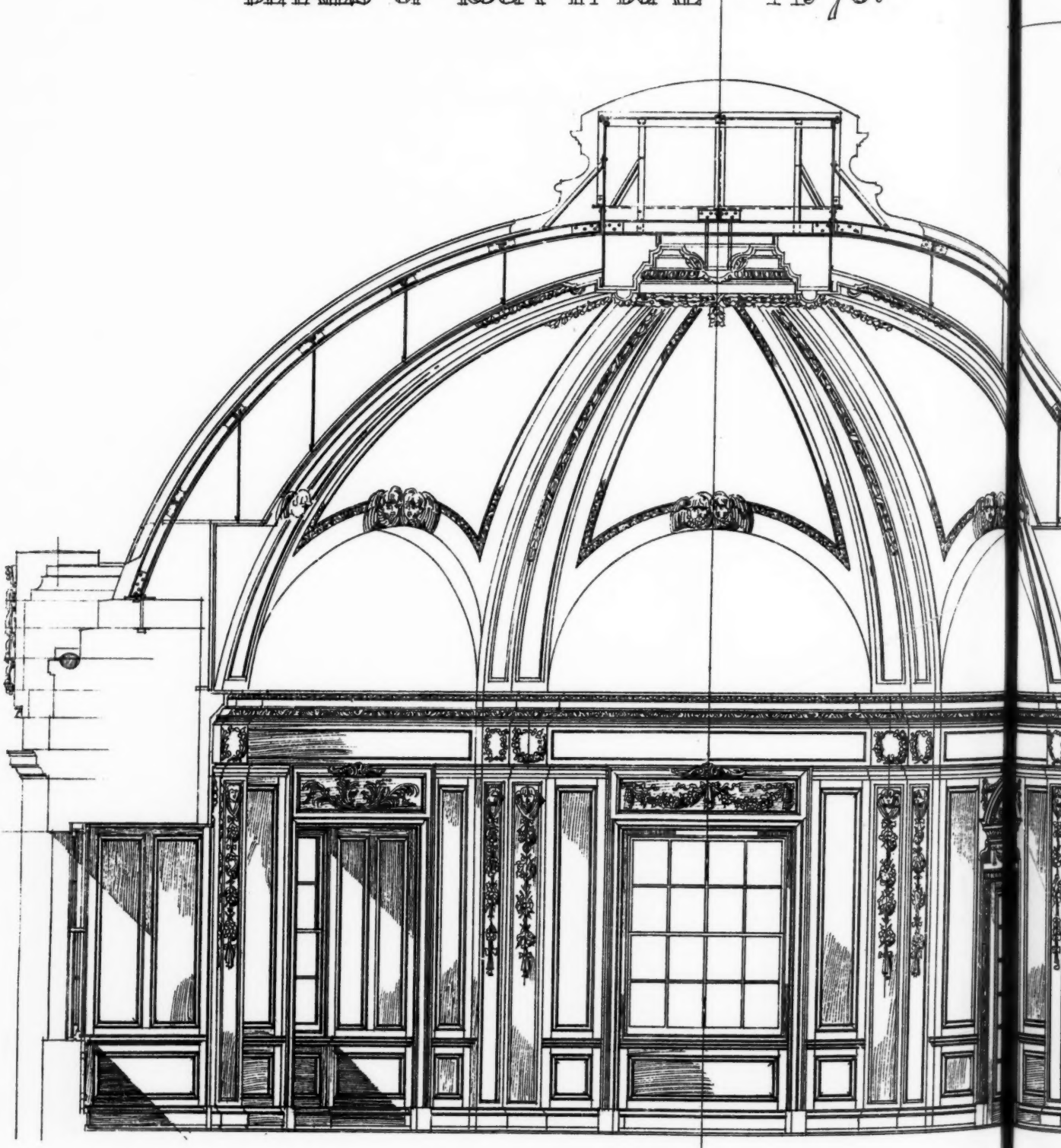
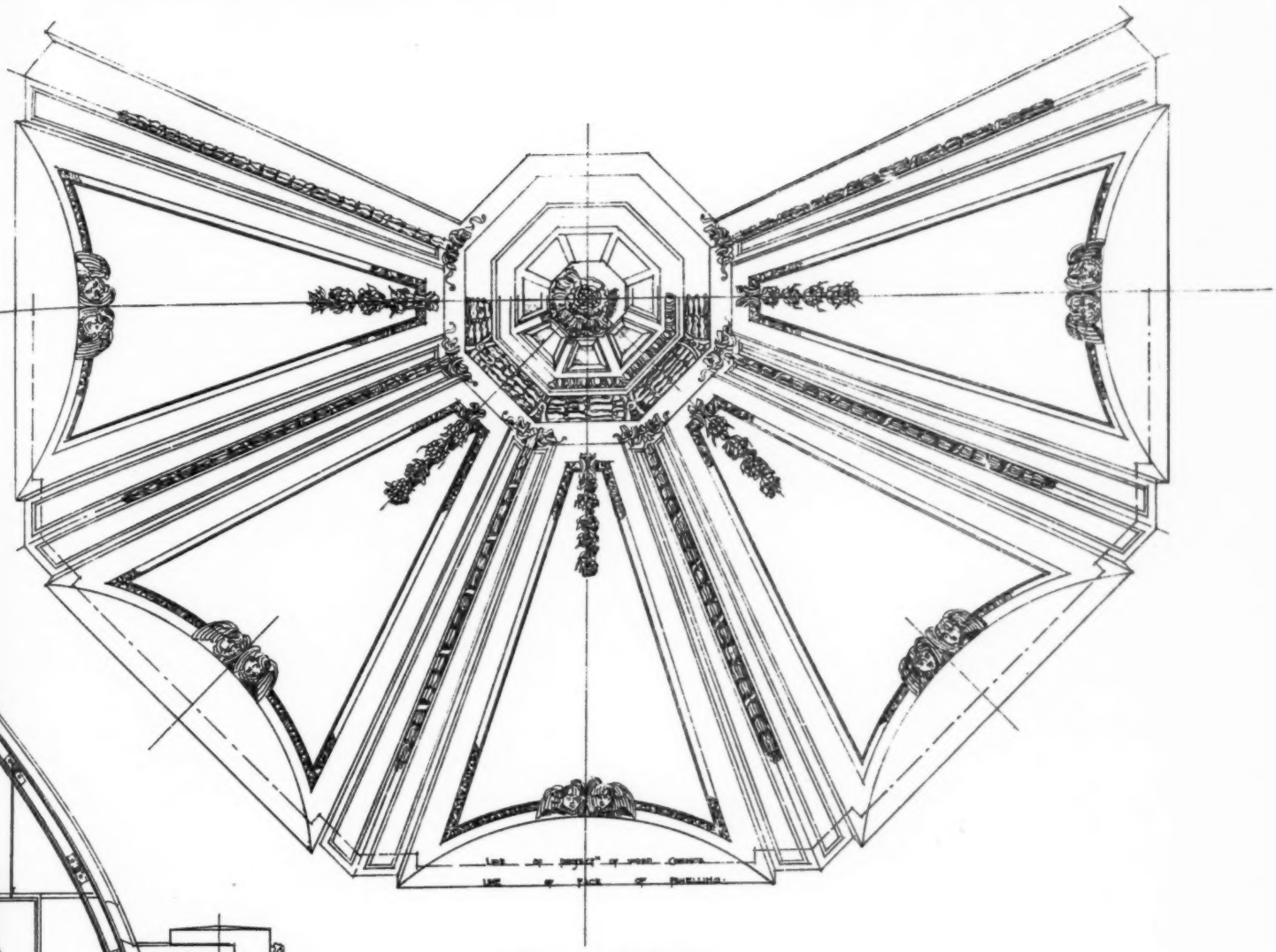
DETAILS OF ROOM IN DOME Nº 70.



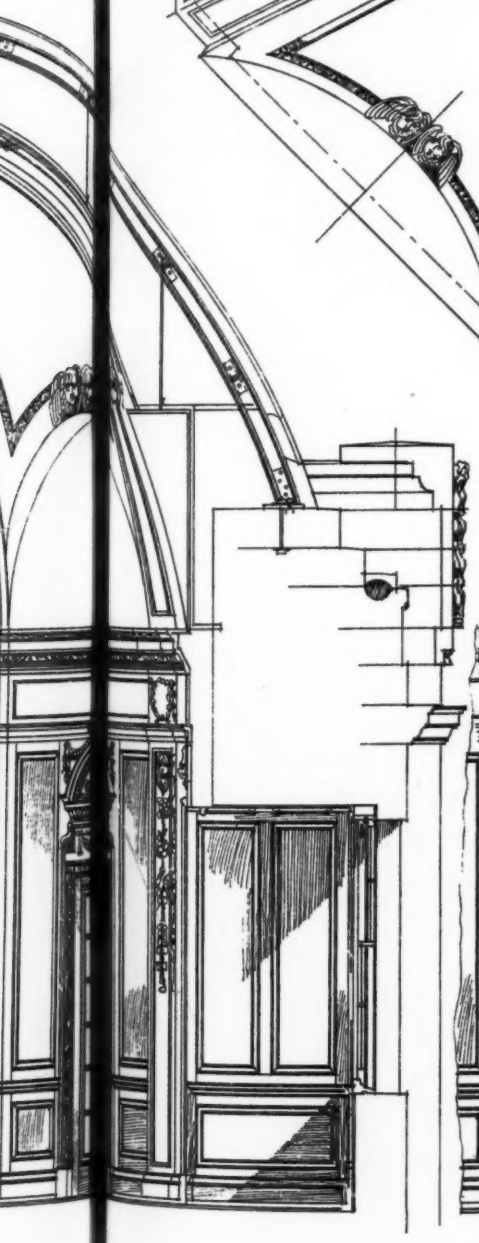
SECTION THRº DOME

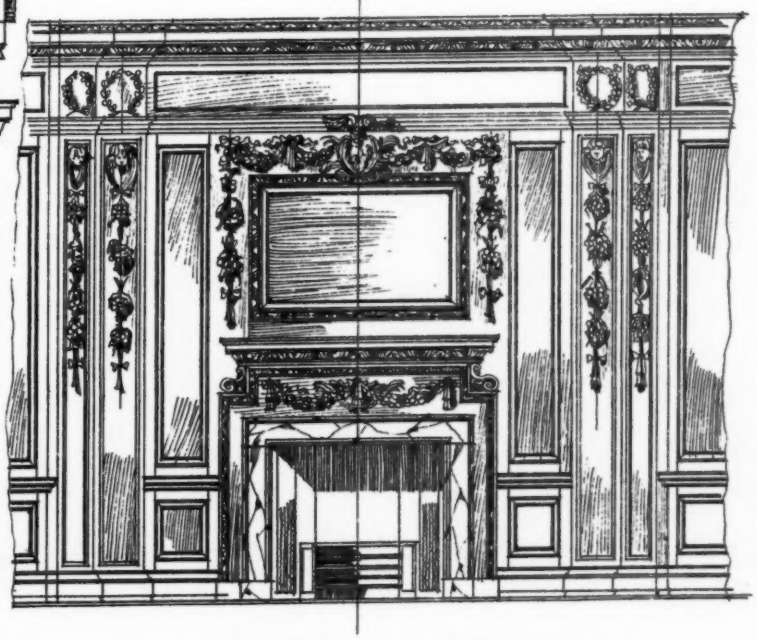
SCALE

Mr. JAMES B. F.R.I.B.



PLAN OF CEILING





ELEVATION OF FIREPLACE

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